









9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 and §90.691

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.

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.

(m) (4) 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.

Part 90.691(a):

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz. (NOTE : Use 100kHz reference bandwidth)

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

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.

- a) Set the RBW = 100kHz for emission below 1GHz and 1MHz for emissions above 1GHz
(Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW $\geq 3 \times$ RBW
- c) Sweep time = auto couple;
- d) Detector = RMS;
- e) Ensure that the number of measurement points = Max (40001);
- f) Trace mode = Average(FDD), Max hold(TDD);

NOTE

5GNR: All waveforms(CP-OFDM vs DFT-OFDM) were investigated to determine the worst case configuration. All mode of operation were investigated and the worst case configuration results are reported in tis section

RESULTS

See the following pages.

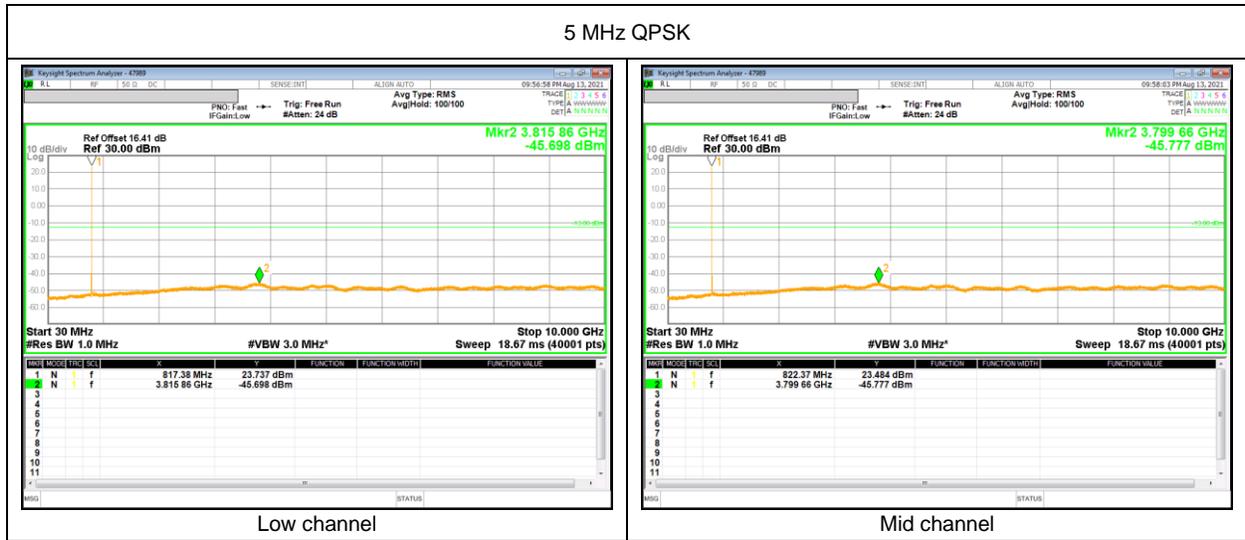
NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE, NR bands.

9.3.1. OUT OF BAND EMISSIONS RESULT

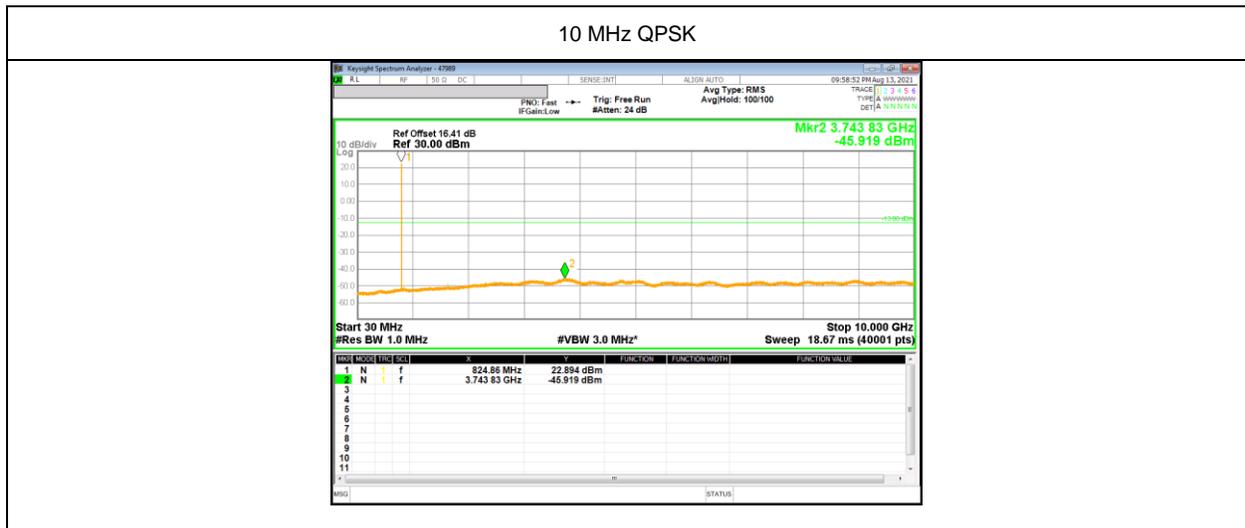
LTE Band 25



LTE Band 26 (Part 90)

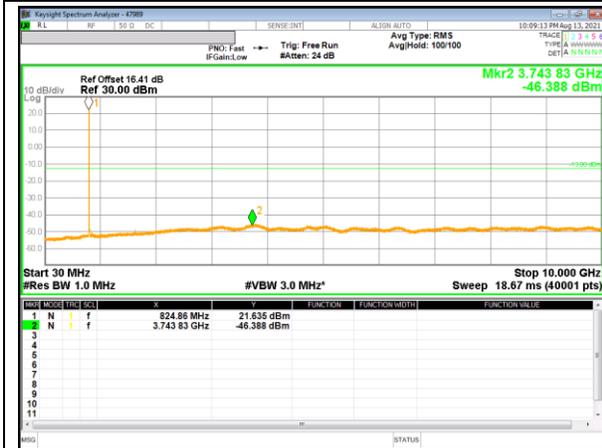


LTE Band 26 (Straddle)

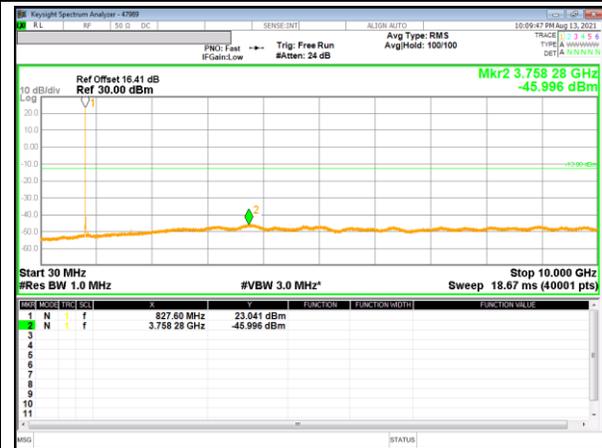


LTE Band 26 (Part 22)

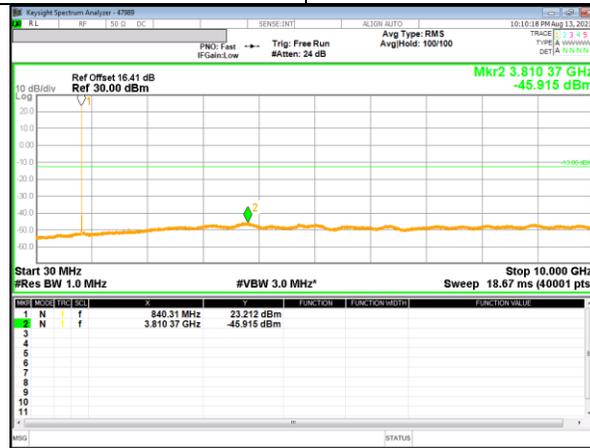
10 MHz QPSK



Low channel



Mid channel



High channel

LTE Band 41

20 MHz QPSK



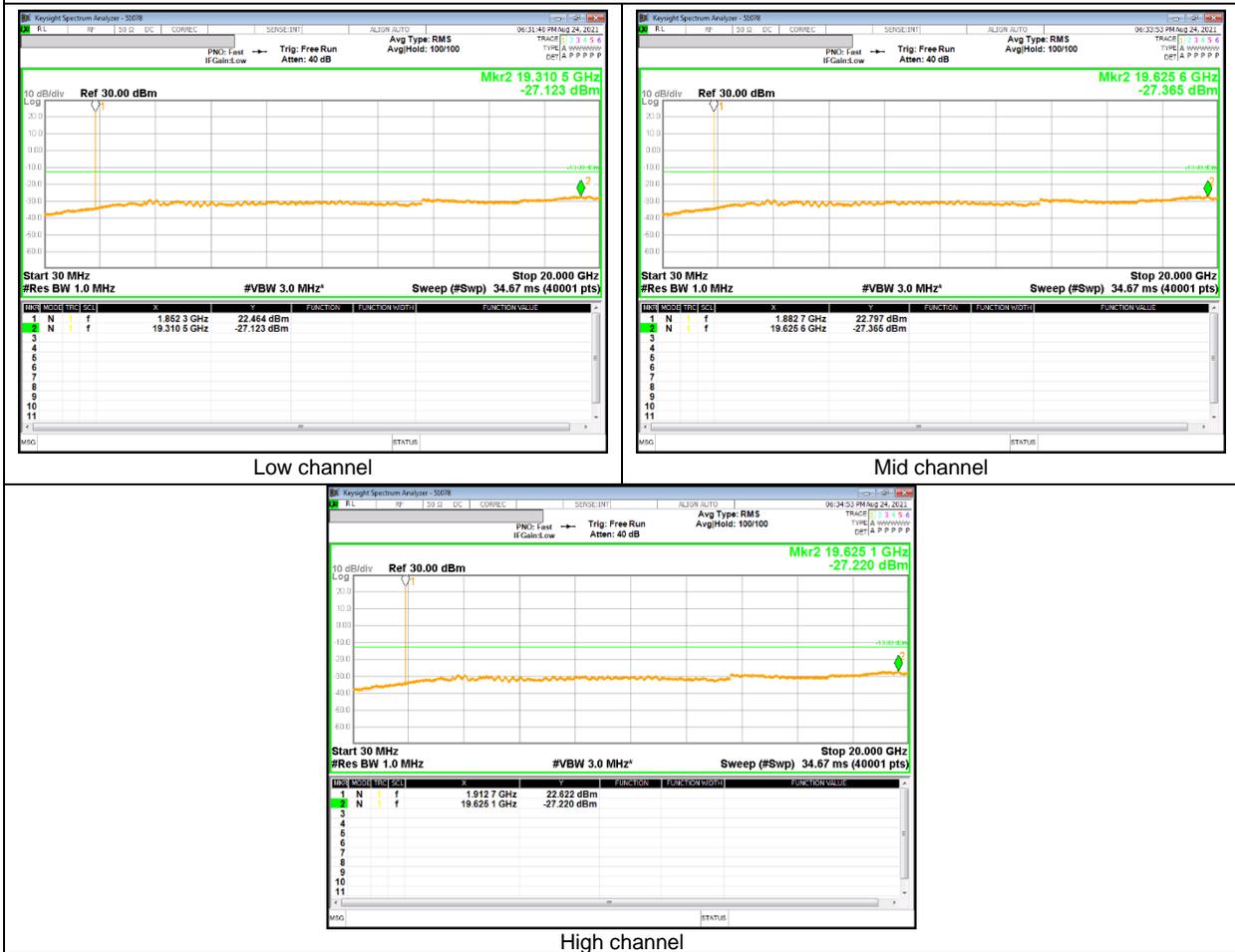
LTE Band 71

5 MHz QPSK



NR Band 25

5 MHz QPSK

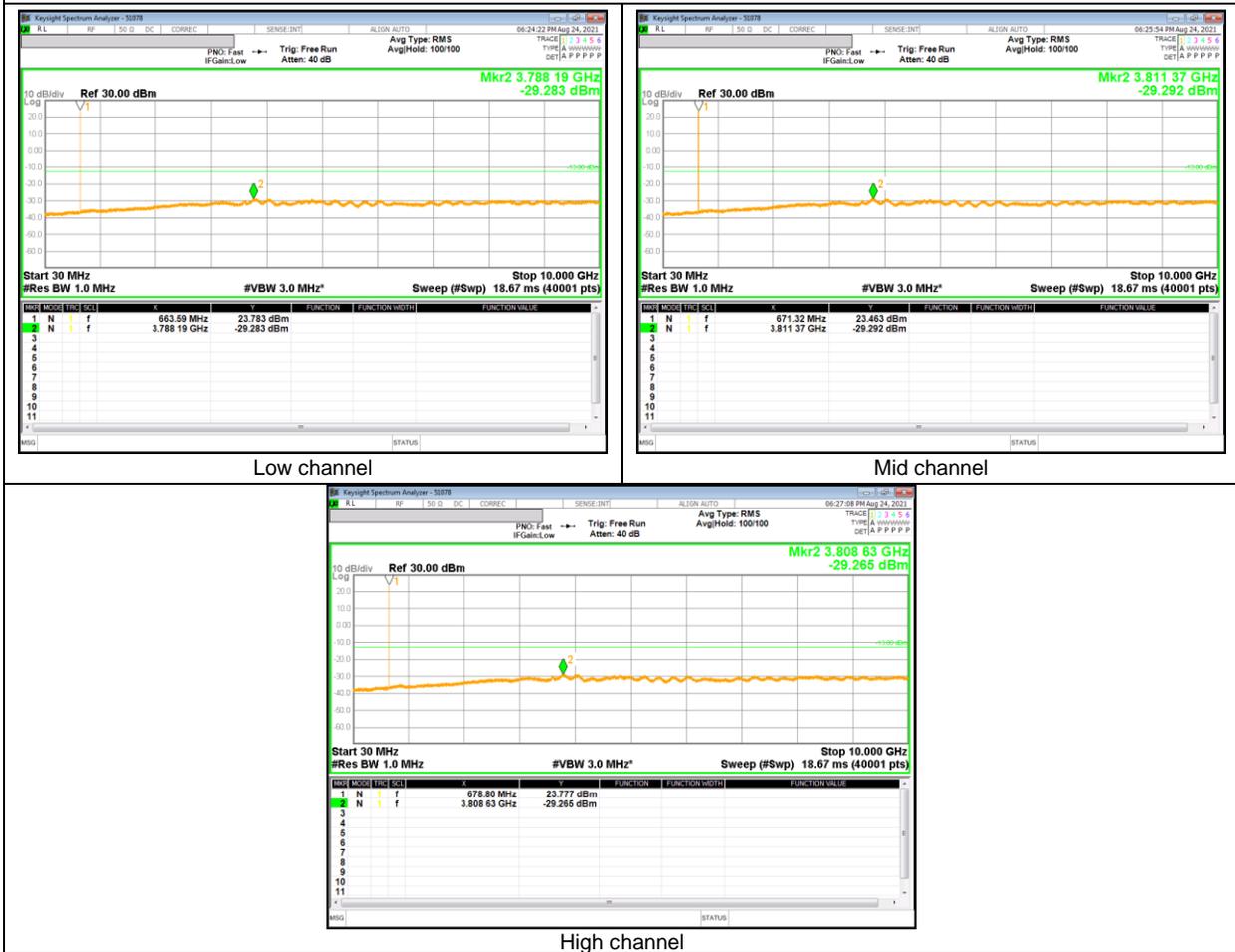


NR Band 41



NR Band 71

20 MHz QPSK



9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54 and §90.213

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.

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

NOTE : Test were performed each lowest or highest frequency on the modulation condition of more wide bandwidth. (Please refer to section 9.1.1 OBW results)

9.4.1. FREQUENCY STABILITY RESULTS

LTE Band 25(Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.1458	1914.8584	36.8	0.020
Extreme (50C)		1850.1458	1914.8584		
Extreme (40C)		1850.1458	1914.8584		
Extreme (30C)		1850.1458	1914.8584		
Extreme (10C)		1850.1458	1914.8584		
Extreme (0C)		1850.1458	1914.8584		
Extreme (-10C)		1850.1458	1914.8584		
Extreme (-20C)		1850.1458	1914.8584		
Extreme (-30C)		1850.1458	1914.8584		
20C	15%	1850.1458	1914.8584	21.6	0.011
	-15%	1850.1458	1914.8584	36.0	0.019
	End Point	1850.1458	1914.8584	37.8	0.020

LTE Band 26

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20°C						
Limit: +- 2.5 ppm =	Low Channel	2036.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.85	50	814.70008850	-0.071	848.30008422	-0.046	2.5
3.85	40	814.70007970	-0.060	848.30008024	-0.041	2.5
3.85	30	814.70006928	-0.047	848.30006828	-0.027	2.5
3.85	20	814.70003060	0.000	848.30004520	0.000	2.5
3.85	10	814.70008006	-0.061	848.30007924	-0.040	2.5
3.85	0	814.70012267	-0.113	848.30010160	-0.066	2.5
3.85	-10	814.70013158	-0.124	848.30012146	-0.090	2.5
3.85	-20	814.70010182	-0.087	848.30010258	-0.068	2.5
3.85	-30	814.70010240	-0.088	848.30010091	-0.066	2.5

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20°C						
Limit: +- 2.5 ppm =	Low Channel	2036.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	20	814.70003060	0	848.30004520	0	2.5
8.70	20	814.70001698	0.017	848.30003141	0.016	2.5
7.35	20	814.70002951	0.001	848.30002104	0.028	2.5

LTE Band 41(Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.2589	2689.7368		
Extreme (50C)		2496.2589	2689.7368	34.4	0.013
Extreme (40C)		2496.2589	2689.7368	37.4	0.014
Extreme (30C)		2496.2589	2689.7368	33.3	0.013
Extreme (10C)		2496.2589	2689.7368	31.7	0.012
Extreme (0C)		2496.2589	2689.7368	30.3	0.012
Extreme (-10C)		2496.2589	2689.7368	36.7	0.014
Extreme (-20C)		2496.2589	2689.7368	41.3	0.016
Extreme (-30C)		2496.2589	2689.7368	39.3	0.015
20C		15%	2496.2589	2689.7368	23.0
	-15%	2496.2589	2689.7368	24.3	0.009
	End Point	2496.2589	2689.7368	24.7	0.010

LTE Band 71 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	663.2505	697.7465		
Extreme (50C)		663.2505	697.7465	8.5	0.012
Extreme (40C)		663.2505	697.7465	9.8	0.014
Extreme (30C)		663.2505	697.7465	10.1	0.015
Extreme (10C)		663.2505	697.7465	11.3	0.017
Extreme (0C)		663.2505	697.7465	13.1	0.019
Extreme (-10C)		663.2505	697.7465	12.8	0.019
Extreme (-20C)		663.2505	697.7465	13.4	0.020
Extreme (-30C)		663.2505	697.7465	15.4	0.023
20C		15%	663.2505	697.7465	11.6
	-15%	663.2505	697.7465	10.6	0.016
	End Point	663.2505	697.7465	11.5	0.017

5G NR Band 25 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.2649	1914.7362		
Extreme (50C)		1850.2649	1914.7362	37.2	0.020
Extreme (40C)		1850.2649	1914.7362	33.8	0.018
Extreme (30C)		1850.2649	1914.7362	34.8	0.018
Extreme (10C)		1850.2649	1914.7362	36.9	0.020
Extreme (0C)		1850.2649	1914.7362	39.3	0.021
Extreme (-10C)		1850.2649	1914.7362	38.9	0.021
Extreme (-20C)		1850.2649	1914.7362	41.3	0.022
Extreme (-30C)		1850.2649	1914.7362	42.6	0.023
20C	15%	1850.2649	1914.7362	26.1	0.014
	-15%	1850.2649	1914.7362	20.4	0.011
	End Point	1850.2649	1914.7362	24.1	0.013

5G NR Band 41 (Lowest Frequency: QPSK / Highest Frequency: QPSK)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.8925	2689.1145		
Extreme (50C)		2496.8925	2689.1145	38.9	0.015
Extreme (40C)		2496.8925	2689.1145	40.2	0.015
Extreme (30C)		2496.8925	2689.1145	30.6	0.012
Extreme (10C)		2496.8925	2689.1145	30.2	0.012
Extreme (0C)		2496.8925	2689.1145	27.9	0.011
Extreme (-10C)		2496.8925	2689.1145	29.1	0.011
Extreme (-20C)		2496.8925	2689.1145	28.7	0.011
Extreme (-30C)		2496.8925	2689.1145	25.6	0.010
20C	15%	2496.8925	2689.1145	15.8	0.006
	-15%	2496.8925	2689.1145	14.2	0.005
	End Point	2496.8925	2689.1145	14.0	0.005

5G NR Band 71 (Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	663.2642	697.7401		
Extreme (50C)		663.2642	697.7401	12.4	0.018
Extreme (40C)		663.2642	697.7401	11.6	0.017
Extreme (30C)		663.2642	697.7401	7.9	0.012
Extreme (10C)		663.2642	697.7401	8.8	0.013
Extreme (0C)		663.2642	697.7401	9.7	0.014
Extreme (-10C)		663.2642	697.7401	10.2	0.015
Extreme (-20C)		663.2642	697.7401	9.2	0.013
Extreme (-30C)		663.2642	697.7401	8.2	0.012
20C	15%	663.2642	697.7401	13.9	0.020
	-15%	663.2642	697.7401	12.8	0.019
	End Point	663.2642	697.7401	14.0	0.021

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50, §27.53 and §90.635

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:

(a)(3) Mobile and portable stations. (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

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

(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.

(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.

(h) The following power limits shall apply in the BRS and EBS:

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

90.635(b) – The maximum output power of the transmitter for mobile stations is 100 watts (20dBw).

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.17; ESU40 setting reference to 971168 D01 v03r01

For radiated output power measurement with a ESU40:

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

NOTE

5GNR: All waveforms(CP-OFDM vs DFT-OFDM) were investigated to determine the worst case configuration. All mode of operation were investigated and the worst case configuration results are reported in tis section.

TEST RESULTS

9.5.1. ERP/EIRP Results

LTE Band 25

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 25	20	QPSK	1/99	1860.0	25.85	384.59
			1/99	1882.5	24.75	298.54
			1/99	1905.0	24.03	252.93
		16QAM	1/99	1860.0	25.16	328.10
			1/0	1882.5	25.06	320.63
			1/99	1905.0	22.94	196.79
	15	QPSK	1/37	1857.5	26.37	433.51
			1/74	1882.5	25.27	336.51
			1/74	1907.5	25.25	334.97
		16QAM	1/74	1857.5	25.14	326.59
			1/37	1882.5	25.06	320.63
			1/74	1907.5	24.36	272.90
	10	QPSK	1/25	1855.0	25.82	381.94
			1/25	1882.5	24.61	289.07
			1/49	1910.0	24.29	268.53
		16QAM	1/25	1855.0	24.73	297.17
			1/25	1882.5	23.11	204.64
			1/49	1910.0	23.35	216.27
	5	QPSK	1/24	1852.5	26.18	414.95
			1/24	1882.5	23.75	237.14
			1/0	1912.5	24.42	276.69
		16QAM	1/24	1852.5	25.14	326.59
			1/24	1882.5	22.75	188.36
			1/0	1912.5	23.62	230.14
	3	QPSK	1/14	1851.5	25.60	363.08
			1/14	1882.5	23.96	248.89
			1/14	1913.5	24.43	277.33
		16QAM	1/0	1851.5	24.68	293.76
			1/14	1882.5	22.88	194.09
			1/8	1913.5	23.50	223.87
1.4	QPSK	1/3	1850.7	26.07	404.58	
		1/3	1882.5	24.19	262.42	
		1/3	1914.3	24.15	260.02	
	16QAM	1/3	1850.7	25.20	331.13	
		1/3	1882.5	23.12	205.12	
		1/3	1914.3	23.14	206.06	

LTE Band 26

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP/EIRP	
			RB Offset		[dBm]	[mW]
Band 26	15	QPSK	1/0	821.5	23.12	205.12
			1/0	831.5	23.07	202.77
			1/37	841.5	22.93	196.34
		16QAM	1/0	821.5	22.43	174.98
			1/74	831.5	21.54	142.56
			1/0	841.5	22.24	167.49
	10	QPSK	1/25	819.0	23.33	215.28
			1/0	829.0	22.95	197.24
			1/0	831.5	22.91	195.43
			1/0	844.0	23.07	202.77
		16QAM	1/25	819.0	22.40	173.78
			1/0	829.0	21.95	156.68
			1/0	831.5	22.19	165.58
			1/0	844.0	22.29	169.43
	5	QPSK	1/12	816.5	23.44	220.80
			1/12	821.5	23.30	213.80
			1/24	826.5	22.98	198.61
			1/24	831.5	22.75	188.36
			1/0	846.5	23.00	199.53
		16QAM	1/12	816.5	21.88	154.17
			1/12	821.5	22.41	174.18
			1/12	826.5	22.25	167.88
			1/24	831.5	22.03	159.59
			1/0	846.5	21.89	154.53
	3	QPSK	1/14	815.5	23.30	213.80
			1/8	822.5	23.40	218.78
			1/8	825.5	23.06	202.30
			1/14	831.5	22.91	195.43
			1/8	847.5	22.79	190.11
		16QAM	1/8	815.5	22.41	174.18
			1/8	822.5	22.34	171.40
			1/8	825.5	22.21	166.34
			1/8	831.5	21.95	156.68
			1/8	847.5	21.66	146.55
	1.4	QPSK	1/3	814.7	23.36	216.77
			1/3	823.3	23.26	211.84
			1/3	824.7	23.12	205.12
			1/3	831.5	22.82	191.43
			1/3	848.3	22.54	179.47
		16QAM	1/3	814.7	22.33	171.00
			1/3	823.3	22.48	177.01
			1/3	824.7	22.60	181.97
1/3			831.5	21.64	145.88	
1/3			848.3	21.76	149.97	

LTE Band 26 (Straddle)

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP/EIRP	
					[dBm]	[mW]
Band 26 Straddle	15	QPSK	1/0	824	23.11	204.64
		16QAM	1/37		22.17	164.82
	10	QPSK	1/25	824	23.12	205.12
		16QAM	1/25		22.45	175.79
	5	QPSK	1/12	824	23.00	199.53
		16QAM	1/12		21.99	158.12
	3	QPSK	1/8	824	23.22	209.89
		16QAM	1/8		22.47	176.60
	1.4	QPSK	1/3	824	23.24	210.86
		16QAM	1/3		22.55	179.89

LTE Band 41 (PC2)

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
					[dBm]	[mW]
Band 41	20	QPSK	1/99	2506.0	28.74	748.17
			1/49	2593.0	30.23	1054.39
			1/49	2680.0	30.26	1061.70
		16QAM	1/99	2506.0	28.37	687.07
			1/49	2593.0	30.02	1004.62
			1/99	2680.0	29.55	901.57
	15	QPSK	1/37	2503.5	27.74	594.29
			1/37	2593.0	30.23	1054.39
			1/37	2682.5	30.73	1183.04
		16QAM	1/0	2503.5	27.90	616.60
			1/37	2593.0	29.78	950.60
			1/37	2682.5	30.35	1083.93
	10	QPSK	1/49	2501.0	28.06	639.73
			1/25	2593.0	30.40	1096.48
			1/25	2685.0	30.48	1116.86
		16QAM	1/49	2501.0	27.84	608.14
			1/25	2593.0	30.21	1049.54
			1/25	2685.0	29.89	974.99
	5	QPSK	1/24	2498.5	27.72	591.56
			1/0	2593.0	30.36	1086.43
			1/12	2687.5	30.68	1169.50
		16QAM	1/12	2498.5	27.10	512.86
			1/0	2593.0	30.04	1009.25
			1/12	2687.5	30.14	1032.76

LTE Band 71

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 71	20	QPSK	1/0	673.0	22.10	162.18
			1/99	680.5	22.96	197.70
			1/99	688.0	22.76	188.80
		16QAM	1/0	673.0	21.13	129.72
			1/99	680.5	22.03	159.59
			1/0	688.0	21.39	137.72
	15	QPSK	1/0	670.5	22.08	161.44
			1/0	680.5	22.55	179.89
			1/74	690.5	22.68	185.35
		16QAM	1/0	670.5	21.07	127.94
			1/37	680.5	22.10	162.18
			1/74	690.5	21.53	142.23
	10	QPSK	1/0	668.0	22.12	162.93
			1/0	680.5	22.24	167.49
			1/49	693.0	22.73	187.50
		16QAM	1/0	668.0	21.00	125.89
			1/0	680.5	21.51	141.58
			1/25	693.0	21.65	146.22
	5	QPSK	1/0	665.5	21.72	148.59
			1/12	680.5	22.59	181.55
			1/12	695.5	22.86	193.20
		16QAM	1/0	665.5	20.56	113.76
			1/24	680.5	22.05	160.32
			1/12	695.5	22.04	159.96

NR Band 25

Band	BW [MHz]	Modulation	Mode	RB Size/	f [MHz]	ERP / EIRP	
				RB Offset		[dBm]	[mW]
n25	20	DFT-s OFDM	QPSK	1/1	1860.0	25.96	394.46
				1/1	1882.5	26.41	437.52
				1/1	1905.0	25.30	338.84
			16QAM	1/1	1860.0	25.29	338.06
				1/1	1882.5	25.45	350.75
				1/1	1905.0	24.59	287.74
	15	DFT-s OFDM	QPSK	1/77	1857.5	23.71	234.96
				1/77	1882.5	22.84	192.31
				1/40	1907.5	23.68	233.35
			16QAM	1/77	1857.5	23.38	217.77
				1/77	1882.5	22.57	180.72
				1/40	1907.5	23.56	226.99
	10	DFT-s OFDM	QPSK	1/26	1855.0	24.39	274.79
				1/50	1882.5	24.18	261.82
				1/50	1910.0	24.29	268.53
			16QAM	1/26	1855.0	24.04	253.51
				1/50	1882.5	23.79	239.33
				1/50	1910.0	24.21	263.63
	5	DFT-s OFDM	QPSK	1/13	1852.5	26.58	454.99
				1/13	1882.5	26.00	398.11
				1/13	1912.5	24.34	271.64
16QAM			1/13	1852.5	25.54	358.10	
			1/13	1882.5	25.08	322.11	
			1/13	1912.5	24.04	253.51	

NR Band 41

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n41	100	DFT-s OFDM	QPSK	1/1	2546.0	30.09	1020.94
				1/1	2593.0	31.12	1294.20
				1/1	2640.0	30.98	1253.14
			16QAM	1/1	2546.0	30.12	1028.02
				1/1	2593.0	31.05	1273.50
				1/1	2640.0	30.80	1202.26
	90	DFT-s OFDM	QPSK	1/1	2541.0	30.16	1037.53
				1/1	2593.0	31.01	1261.83
				1/1	2645.0	30.87	1221.80
			16QAM	1/1	2541.0	30.25	1059.25
				1/1	2593.0	30.99	1256.03
				1/1	2645.0	30.73	1183.04
	80	DFT-s OFDM	QPSK	1/109	2536.0	30.30	1071.52
				1/1	2593.0	30.95	1244.51
				1/1	2650.0	30.81	1205.04
			16QAM	1/109	2536.0	30.24	1056.82
				1/1	2593.0	30.92	1235.95
				1/1	2650.0	30.80	1202.26
	60	DFT-s OFDM	QPSK	1/81	2526.0	29.25	841.40
				1/1	2593.0	31.11	1291.22
				1/1	2660.0	30.65	1161.45
			16QAM	1/81	2526.0	29.19	829.85
				1/1	2593.0	30.33	1078.95
				1/1	2660.0	30.65	1161.45
	50	DFT-s OFDM	QPSK	1/1	2521.0	29.77	948.42
				1/1	2593.0	30.83	1210.60
				1/1	2665.0	30.08	1018.59
			16QAM	1/1	2521.0	29.74	941.89
				1/1	2593.0	30.82	1207.81
				1/1	2665.0	30.07	1016.25
	40	DFT-s OFDM	QPSK	1/104	2516.0	30.15	1035.14
				1/1	2593.0	30.85	1216.19
				1/1	2670.0	30.09	1020.94
			16QAM	1/104	2516.0	30.12	1028.02
				1/1	2593.0	30.85	1216.19
				1/1	2670.0	30.05	1011.58
	30	DFT-s OFDM	QPSK	1/76	2511.0	27.09	511.68
				1/1	2593.0	30.86	1218.99
				1/1	2675.0	30.25	1059.25
			16QAM	1/76	2511.0	27.06	508.16
				1/1	2593.0	30.85	1216.19
				1/1	2675.0	30.22	1051.96
	20	DFT-s OFDM	QPSK	1/49	2506.0	24.15	260.02
				1/1	2593.0	30.40	1096.48
				1/1	2680.0	29.84	963.83
			16QAM	1/49	2506.0	24.10	257.04
				1/1	2593.0	30.38	1091.44
				1/1	2680.0	29.83	961.61

NR Band 71

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n71	20	DFT-s OFDM	QPSK	1/1	673.0	22.11	162.55
				1/1	680.5	22.40	173.78
				1/1	688.0	21.99	158.12
			16QAM	1/1	673.0	21.35	136.46
				1/1	680.5	21.28	134.28
				1/1	688.0	21.10	128.82
	15	DFT-s OFDM	QPSK	1/1	670.5	22.17	164.82
				1/1	680.5	22.44	175.39
				1/1	690.5	21.98	157.76
			16QAM	1/1	670.5	21.51	141.58
				1/1	680.5	21.82	152.05
				1/1	690.5	21.10	128.82
	10	DFT-s OFDM	QPSK	1/1	668.0	21.93	155.96
				1/1	680.5	22.35	171.79
				1/1	693.0	22.29	169.43
			16QAM	1/1	668.0	21.19	131.52
				1/1	680.5	21.21	132.13
				1/1	693.0	21.25	133.35
	5	DFT-s OFDM	QPSK	1/1	665.5	21.55	142.89
				1/1	680.5	22.27	168.66
				1/1	695.5	22.43	174.98
			16QAM	1/1	665.5	20.84	121.34
				1/1	680.5	21.74	149.28
				1/1	695.5	21.53	142.23

9.5.2. ERP/EIRP DATA

LTE Band 25

20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
	<p> Company: Samsung Project #: 4790047184 Date: 8/23/2021 Test Engineer: 20890 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 25 Fundamentals, 20MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1860.00</td> <td>18.73</td> <td>V</td> <td>4.6</td> <td>9.6</td> <td>23.73</td> <td>33.0</td> <td>-9.3</td> <td></td> </tr> <tr> <td>1860.00</td> <td>20.85</td> <td>H</td> <td>4.6</td> <td>9.6</td> <td>25.85</td> <td>33.0</td> <td>-7.1</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1882.50</td> <td>19.42</td> <td>V</td> <td>4.6</td> <td>9.3</td> <td>24.19</td> <td>33.0</td> <td>-8.8</td> <td></td> </tr> <tr> <td>1882.50</td> <td>19.98</td> <td>H</td> <td>4.6</td> <td>9.3</td> <td>24.75</td> <td>33.0</td> <td>-8.3</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1905.00</td> <td>18.04</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>22.56</td> <td>33.0</td> <td>-10.4</td> <td></td> </tr> <tr> <td>1905.00</td> <td>19.50</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>24.03</td> <td>33.0</td> <td>-9.0</td> <td></td> </tr> </tbody> </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									1860.00	18.73	V	4.6	9.6	23.73	33.0	-9.3		1860.00	20.85	H	4.6	9.6	25.85	33.0	-7.1		Mid Ch									1882.50	19.42	V	4.6	9.3	24.19	33.0	-8.8		1882.50	19.98	H	4.6	9.3	24.75	33.0	-8.3		High Ch									1905.00	18.04	V	4.6	9.1	22.56	33.0	-10.4		1905.00	19.50	H	4.6	9.1	24.03	33.0	-9.0
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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<p> Company: Samsung Project #: 4790047184 Date: 8/23/2021 Test Engineer: 20890 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 25 Fundamentals, 20MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1860.00</td> <td>18.36</td> <td>V</td> <td>4.6</td> <td>9.6</td> <td>23.36</td> <td>33.0</td> <td>-9.6</td> <td></td> </tr> <tr> <td>1860.00</td> <td>20.16</td> <td>H</td> <td>4.6</td> <td>9.6</td> <td>25.16</td> <td>33.0</td> <td>-7.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1882.50</td> <td>18.02</td> <td>V</td> <td>4.6</td> <td>9.3</td> <td>22.79</td> <td>33.0</td> <td>-10.2</td> <td></td> </tr> <tr> <td>1882.50</td> <td>20.29</td> <td>H</td> <td>4.6</td> <td>9.3</td> <td>25.06</td> <td>33.0</td> <td>-7.9</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1905.00</td> <td>17.12</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>21.64</td> <td>33.0</td> <td>-11.4</td> <td></td> </tr> <tr> <td>1905.00</td> <td>18.41</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>22.94</td> <td>33.0</td> <td>-10.1</td> <td></td> </tr> </tbody> </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									1860.00	18.36	V	4.6	9.6	23.36	33.0	-9.6		1860.00	20.16	H	4.6	9.6	25.16	33.0	-7.8		Mid Ch									1882.50	18.02	V	4.6	9.3	22.79	33.0	-10.2		1882.50	20.29	H	4.6	9.3	25.06	33.0	-7.9		High Ch									1905.00	17.12	V	4.6	9.1	21.64	33.0	-11.4		1905.00	18.41	H	4.6	9.1	22.94	33.0	-10.1	
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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15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																									
	<p> Company: Samsung Project #: 4790047184 Date: 8/12/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 25 Fundamentals, 15MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1857.50</td> <td>17.75</td> <td>V</td> <td>4.5</td> <td>9.6</td> <td>22.78</td> <td>33.0</td> <td>-10.2</td> <td></td> </tr> <tr> <td>1857.50</td> <td>21.34</td> <td>H</td> <td>4.5</td> <td>9.6</td> <td>26.37</td> <td>33.0</td> <td>-6.6</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1882.50</td> <td>19.01</td> <td>V</td> <td>4.6</td> <td>9.3</td> <td>23.78</td> <td>33.0</td> <td>-9.2</td> <td></td> </tr> <tr> <td>1882.50</td> <td>20.50</td> <td>H</td> <td>4.6</td> <td>9.3</td> <td>25.27</td> <td>33.0</td> <td>-7.7</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1907.50</td> <td>19.46</td> <td>V</td> <td>4.6</td> <td>9.1</td> <td>23.95</td> <td>33.0</td> <td>-9.0</td> <td></td> </tr> <tr> <td>1907.50</td> <td>20.76</td> <td>H</td> <td>4.6</td> <td>9.1</td> <td>25.25</td> <td>33.0</td> <td>-7.8</td> <td></td> </tr> </tbody> </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	17.75	V	4.5	9.6	22.78	33.0	-10.2		1857.50	21.34	H	4.5	9.6	26.37	33.0	-6.6		Mid Ch									1882.50	19.01	V	4.6	9.3	23.78	33.0	-9.2		1882.50	20.50	H	4.6	9.3	25.27	33.0	-7.7		High Ch									1907.50	19.46	V	4.6	9.1	23.95	33.0	-9.0		1907.50	20.76	H	4.6	9.1	25.25	33.0	-7.8
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LTE Band 26 (Part 90)

15MHz QPSK	<p>UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth</p> <p>Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable</p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>821.50</td> <td>25.86</td> <td>V</td> <td>3.0</td> <td>-1.0</td> <td>21.85</td> <td>50.0</td> <td>-28.1</td> <td></td> </tr> <tr> <td>821.50</td> <td>27.13</td> <td>H</td> <td>3.0</td> <td>-1.0</td> <td>23.12</td> <td>50.0</td> <td>-26.9</td> <td></td> </tr> </tbody> </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									821.50	25.86	V	3.0	-1.0	21.85	50.0	-28.1		821.50	27.13	H	3.0	-1.0	23.12	50.0	-26.9	
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10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
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	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	819.00	25.96	V	3.0	-1.0	21.95	50.0	-28.1	
	819.00	27.33	H	3.0	-1.0	23.33	50.0	-26.7	
10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
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	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	819.00	24.81	V	3.0	-1.0	20.80	50.0	-29.2	
	819.00	26.40	H	3.0	-1.0	22.40	50.0	-27.6	

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LTE Band 26 (Straddle & Part 22)

15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
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	<p> Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth </p> <p> Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Straddle Ch</td> </tr> <tr> <td>824.00</td> <td>24.89</td> <td>V</td> <td>3.0</td> <td>-1.0</td> <td>20.90</td> <td>38.5</td> <td>-17.6</td> <td></td> </tr> <tr> <td>824.00</td> <td>26.17</td> <td>H</td> <td>3.0</td> <td>-1.0</td> <td>22.17</td> <td>38.5</td> <td>-16.3</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>831.50</td> <td>23.84</td> <td>V</td> <td>3.1</td> <td>-0.9</td> <td>19.86</td> <td>38.5</td> <td>-18.6</td> <td></td> </tr> <tr> <td>831.50</td> <td>25.52</td> <td>H</td> <td>3.1</td> <td>-0.9</td> <td>21.54</td> <td>38.5</td> <td>-17.0</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>841.50</td> <td>25.37</td> <td>V</td> <td>3.1</td> <td>-0.9</td> <td>21.41</td> <td>38.5</td> <td>-17.1</td> <td></td> </tr> <tr> <td>841.50</td> <td>26.19</td> <td>H</td> <td>3.1</td> <td>-0.9</td> <td>22.24</td> <td>38.5</td> <td>-16.3</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Straddle Ch									824.00	24.89	V	3.0	-1.0	20.90	38.5	-17.6		824.00	26.17	H	3.0	-1.0	22.17	38.5	-16.3		Mid Ch									831.50	23.84	V	3.1	-0.9	19.86	38.5	-18.6		831.50	25.52	H	3.1	-0.9	21.54	38.5	-17.0		High Ch									841.50	25.37	V	3.1	-0.9	21.41	38.5	-17.1		841.50	26.19	H	3.1	-0.9	22.24	38.5	-16.3
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		UL Verification Services, Inc. High Frequency Substitution Measurement								
10MHz QPSK	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Straddle Ch									
	824.00	25.10	V	3.0	-1.0	21.11	38.5	-17.4		
	824.00	27.12	H	3.0	-1.0	23.12	38.5	-15.4		
	Low Ch									
	829.00	25.25	V	3.1	-0.9	21.26	38.5	-17.2		
	829.00	26.94	H	3.1	-0.9	22.95	38.5	-15.5		
	Mid Ch									
	831.50	25.64	V	3.1	-0.9	21.66	38.5	-16.8		
	831.50	26.89	H	3.1	-0.9	22.91	38.5	-15.6		
	High Ch									
	844.00	25.76	V	3.1	-0.9	21.81	38.5	-16.7		
	844.00	27.02	H	3.1	-0.9	23.07	38.5	-15.4		
	10MHz 16QAM	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Straddle Ch								
824.00		24.48	V	3.0	-1.0	20.49	38.5	-18.0		
824.00		26.45	H	3.0	-1.0	22.45	38.5	-16.0		
Low Ch										
829.00		24.34	V	3.1	-0.9	20.35	38.5	-18.1		
829.00		25.94	H	3.1	-0.9	21.95	38.5	-16.5		
Mid Ch										
831.50		24.89	V	3.1	-0.9	20.91	38.5	-17.6		
831.50		26.17	H	3.1	-0.9	22.19	38.5	-16.3		
High Ch										
844.00		25.04	V	3.1	-0.9	21.09	38.5	-17.4		
844.00		26.24	H	3.1	-0.9	22.29	38.5	-16.2		

		UL Verification Services, Inc. High Frequency Substitution Measurement							
5MHz QPSK	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Straddle Ch								
	824.00	25.64	V	3.0	-1.0	21.65	38.5	-16.9	
	824.00	27.00	H	3.0	-1.0	23.00	38.5	-15.5	
	Low Ch								
	826.50	25.42	V	3.0	-0.9	21.42	38.5	-17.1	
	826.50	26.97	H	3.0	-0.9	22.98	38.5	-15.5	
	Mid Ch								
	831.50	25.12	V	3.1	-0.9	21.14	38.5	-17.4	
	831.50	26.73	H	3.1	-0.9	22.75	38.5	-15.8	
	High Ch								
	846.50	25.59	V	3.1	-0.9	21.64	38.5	-16.9	
	846.50	26.94	H	3.1	-0.9	23.00	38.5	-15.5	
	5MHz 16QAM	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable							
f MHz		SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch									
824.00		24.79	V	3.0	-1.0	20.80	38.5	-17.7	
824.00		25.99	H	3.0	-1.0	21.99	38.5	-16.5	
Low Ch									
826.50		24.95	V	3.0	-0.9	20.95	38.5	-17.5	
826.50		26.24	H	3.0	-0.9	22.25	38.5	-16.2	
Mid Ch									
831.50		24.52	V	3.1	-0.9	20.54	38.5	-18.0	
831.50		26.01	H	3.1	-0.9	22.03	38.5	-16.5	
High Ch									
846.50		24.78	V	3.1	-0.9	20.83	38.5	-17.7	
846.50		25.83	H	3.1	-0.9	21.89	38.5	-16.6	

3MHz QPSK		UL Verification Services, Inc. High Frequency Substitution Measurement								
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
		Straddle Ch								
		824.00	25.70	V	3.0	-1.0	21.71	38.5	-16.8	
		824.00	27.22	H	3.0	-1.0	23.22	38.5	-15.3	
		Low Ch								
		825.50	25.57	V	3.0	-0.9	21.58	38.5	-16.9	
		825.50	27.05	H	3.0	-0.9	23.06	38.5	-15.4	
		Mid Ch								
		831.50	25.34	V	3.1	-0.9	21.36	38.5	-17.1	
		831.50	26.89	H	3.1	-0.9	22.91	38.5	-15.6	
		High Ch								
		847.50	25.09	V	3.1	-0.9	21.15	38.5	-17.4	
		847.50	26.73	H	3.1	-0.9	22.79	38.5	-15.7	

3MHz 16QAM		UL Verification Services, Inc. High Frequency Substitution Measurement								
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
		Straddle Ch								
		824.00	24.91	V	3.0	-1.0	20.92	38.5	-17.6	
		824.00	26.47	H	3.0	-1.0	22.47	38.5	-16.0	
		Low Ch								
		825.50	24.57	V	3.0	-0.9	20.58	38.5	-17.9	
		825.50	26.20	H	3.0	-0.9	22.21	38.5	-16.3	
		Mid Ch								
		831.50	24.69	V	3.1	-0.9	20.71	38.5	-17.8	
		831.50	25.93	H	3.1	-0.9	21.95	38.5	-16.6	
		High Ch								
		847.50	24.17	V	3.1	-0.9	20.23	38.5	-18.3	
		847.50	25.60	H	3.1	-0.9	21.66	38.5	-16.8	

		UL Verification Services, Inc. High Frequency Substitution Measurement								
1.4MHz QPSK	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Straddle Ch								
		824.00	25.90	V	3.0	-1.0	21.91	38.5	-16.6	
		824.00	27.24	H	3.0	-1.0	23.24	38.5	-15.3	
		Low Ch								
		824.70	25.58	V	3.0	-1.0	21.58	38.5	-16.9	
		824.70	27.12	H	3.0	-1.0	23.12	38.5	-15.4	
		Mid Ch								
		831.50	25.85	V	3.1	-0.9	21.87	38.5	-16.6	
		831.50	26.80	H	3.1	-0.9	22.82	38.5	-15.7	
		High Ch								
		848.30	25.30	V	3.1	-0.9	21.36	38.5	-17.1	
		848.30	26.48	H	3.1	-0.9	22.54	38.5	-16.0	
	1.4MHz 16QAM	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 22943 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Straddle Ch								
		824.00	24.54	V	3.0	-1.0	20.55	38.5	-18.0	
		824.00	26.55	H	3.0	-1.0	22.55	38.5	-15.9	
		Low Ch								
		824.70	24.78	V	3.0	-1.0	20.78	38.5	-17.7	
		824.70	26.60	H	3.0	-1.0	22.60	38.5	-15.9	
		Mid Ch								
		831.50	24.49	V	3.1	-0.9	20.51	38.5	-18.0	
		831.50	25.62	H	3.1	-0.9	21.64	38.5	-16.9	
		High Ch								
		848.30	24.17	V	3.1	-0.9	20.23	38.5	-18.3	
		848.30	25.70	H	3.1	-0.9	21.76	38.5	-16.7	

LTE Band 41

20MHz QPSK	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4790047184 Date: 8/24/2021 Test Engineer: 20890 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth</p> <p>Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable</p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>2506.00</td> <td>16.25</td> <td>V</td> <td>5.3</td> <td>10.2</td> <td>21.15</td> <td>33.0</td> <td>-11.8</td> <td></td> </tr> <tr> <td>2506.00</td> <td>23.83</td> <td>H</td> <td>5.3</td> <td>10.2</td> <td>28.74</td> <td>33.0</td> <td>-4.3</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>2593.00</td> <td>19.27</td> <td>V</td> <td>5.4</td> <td>10.1</td> <td>24.01</td> <td>33.0</td> <td>-9.0</td> <td></td> </tr> <tr> <td>2593.00</td> <td>25.49</td> <td>H</td> <td>5.4</td> <td>10.1</td> <td>30.23</td> <td>33.0</td> <td>-2.8</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>2680.00</td> <td>18.68</td> <td>V</td> <td>5.5</td> <td>10.2</td> <td>23.38</td> <td>33.0</td> <td>-9.6</td> <td></td> </tr> <tr> <td>2680.00</td> <td>25.55</td> <td>H</td> <td>5.5</td> <td>10.2</td> <td>30.26</td> <td>33.0</td> <td>-2.7</td> <td></td> </tr> </tbody> </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									2506.00	16.25	V	5.3	10.2	21.15	33.0	-11.8		2506.00	23.83	H	5.3	10.2	28.74	33.0	-4.3		Mid Ch									2593.00	19.27	V	5.4	10.1	24.01	33.0	-9.0		2593.00	25.49	H	5.4	10.1	30.23	33.0	-2.8		High Ch									2680.00	18.68	V	5.5	10.2	23.38	33.0	-9.6		2680.00	25.55	H	5.5	10.2	30.26	33.0	-2.7	
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2593.00	19.27	V	5.4	10.1	24.01	33.0	-9.0																																																																																												
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2680.00	18.68	V	5.5	10.2	23.38	33.0	-9.6																																																																																												
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2593.00	19.11	V	5.4	10.1	23.85	33.0	-9.2																																																																																												
2593.00	25.28	H	5.4	10.1	30.02	33.0	-3.0																																																																																												
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2680.00	17.48	V	5.5	10.2	22.18	33.0	-10.8																																																																																												
2680.00	24.84	H	5.5	10.2	29.55	33.0	-3.4																																																																																												

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LTE Band 71

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5MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 1 Mode: NR_QPSK n25 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-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	19.73	V	4.5	9.6	24.77	33.0	-8.2	
	1852.50	21.53	H	4.5	9.6	26.58	33.0	-6.4	
	Mid Ch								
	1882.50	18.58	V	4.6	9.4	23.37	33.0	-9.6	
	1882.50	21.21	H	4.6	9.4	26.00	33.0	-7.0	
High Ch									
1912.50	16.74	V	4.6	9.1	21.22	33.0	-11.8		
1912.50	19.85	H	4.6	9.1	24.34	33.0	-8.7		
5MHz DFT-s 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790047184 Date: 8/25/2021 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 1 Mode: NR_16QAM n25 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-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	18.94	V	4.5	9.6	23.98	33.0	-9.0	
	1852.50	20.49	H	4.5	9.6	25.54	33.0	-7.5	
	Mid Ch								
	1882.50	17.76	V	4.6	9.4	22.55	33.0	-10.4	
	1882.50	20.29	H	4.6	9.4	25.08	33.0	-7.9	
High Ch									
1912.50	16.75	V	4.6	9.1	21.23	33.0	-11.8		
1912.50	19.55	H	4.6	9.1	24.04	33.0	-9.0		

NR Band 41

100MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company:		Samsung						
	Project #:		4790047184						
	Date:		8/23/2021						
	Test Engineer:		19568						
	Configuration:		EUT, X-Position						
	Location:		Chamber 1						
	Mode:		NR_QPSK n41 Fundamentals, 100MHz Bandwidth						
	Test Equipment:								
	Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables								
	Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)		
Low Ch									
2546.01	17.76	V	5.3	10.1	22.52	33.0	-10.5		
2546.01	25.34	H	5.3	10.1	30.09	33.0	-2.9		
Mid Ch									
2593.00	21.41	V	5.4	10.0	26.07	33.0	-6.9		
2593.00	26.47	H	5.4	10.0	31.12	33.0	-1.9		
High Ch									
2640.00	19.38	V	5.4	10.0	23.98	33.0	-9.0		
2640.00	26.38	H	5.4	10.0	30.98	33.0	-2.0		

100MHz DFT-s 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company:		Samsung						
	Project #:		4790047184						
	Date:		8/23/2021						
	Test Engineer:		19568						
	Configuration:		EUT, X-Position						
	Location:		Chamber 1						
	Mode:		NR_16QAM n41 Fundamentals, 100MHz Bandwidth						
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	Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)		
Low Ch									
2546.01	17.74	V	5.3	10.1	22.50	33.0	-10.5		
2546.01	25.37	H	5.3	10.1	30.12	33.0	-2.9		
Mid Ch									
2593.00	21.66	V	5.4	10.0	26.32	33.0	-6.7		
2593.00	26.40	H	5.4	10.0	31.05	33.0	-1.9		
High Ch									
2640.00	19.34	V	5.4	10.0	23.94	33.0	-9.1		
2640.00	26.20	H	5.4	10.0	30.80	33.0	-2.2		

90MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																
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80MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790047184 Date: 8/23/2021 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: NR_QPSK n41 Fundamentals, 80MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-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								
	2536.02	17.56	V	5.3	10.1	22.35	33.0	-10.7	
	2536.02	25.51	H	5.3	10.1	30.30	33.0	-2.7	
	Mid Ch								
	2593.00	18.22	V	5.4	10.0	22.88	33.0	-10.1	
	2593.00	26.30	H	5.4	10.0	30.95	33.0	-2.0	
High Ch									
2649.99	19.33	V	5.4	10.0	23.92	33.0	-9.1		
2649.99	26.22	H	5.4	10.0	30.81	33.0	-2.2		
80MHz DFT-s 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790047184 Date: 8/23/2021 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: NR_16QAM n41 Fundamentals, 80MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-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								
	2536.02	17.52	V	5.3	10.1	22.31	33.0	-10.7	
	2536.02	25.45	H	5.3	10.1	30.24	33.0	-2.8	
	Mid Ch								
	2593.00	17.85	V	5.4	10.0	22.51	33.0	-10.5	
	2593.00	26.27	H	5.4	10.0	30.92	33.0	-2.1	
High Ch									
2649.99	19.29	V	5.4	10.0	23.88	33.0	-9.1		
2649.99	26.21	H	5.4	10.0	30.80	33.0	-2.2		

60MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																									
	<p> Company: Samsung Project #: 4790047184 Date: 8/24/2021 Test Engineer: 19568 Configuration: EUT, X-Position Location: Chamber 1 Mode: NR_QPSK n41 Fundamentals, 60MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>2526.00</td> <td>18.23</td> <td>V</td> <td>5.3</td> <td>10.1</td> <td>23.04</td> <td>33.0</td> <td>-10.0</td> <td></td> </tr> <tr> <td>2526.00</td> <td>24.43</td> <td>H</td> <td>5.3</td> <td>10.1</td> <td>29.25</td> <td>33.0</td> <td>-3.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>2593.00</td> <td>20.49</td> <td>V</td> <td>5.4</td> <td>10.0</td> <td>25.15</td> <td>33.0</td> <td>-7.9</td> <td></td> </tr> <tr> <td>2593.00</td> <td>26.46</td> <td>H</td> <td>5.4</td> <td>10.0</td> <td>31.11</td> <td>33.0</td> <td>-1.9</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>2659.98</td> <td>19.22</td> <td>V</td> <td>5.5</td> <td>10.0</td> <td>23.80</td> <td>33.0</td> <td>-9.2</td> <td></td> </tr> <tr> <td>2659.98</td> <td>26.07</td> <td>H</td> <td>5.5</td> <td>10.0</td> <td>30.65</td> <td>33.0</td> <td>-2.3</td> <td></td> </tr> </tbody> </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									2526.00	18.23	V	5.3	10.1	23.04	33.0	-10.0		2526.00	24.43	H	5.3	10.1	29.25	33.0	-3.8		Mid Ch									2593.00	20.49	V	5.4	10.0	25.15	33.0	-7.9		2593.00	26.46	H	5.4	10.0	31.11	33.0	-1.9		High Ch									2659.98	19.22	V	5.5	10.0	23.80	33.0	-9.2		2659.98	26.07	H	5.5	10.0	30.65	33.0	-2.3
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	<p> Company: Samsung Project #: 4790047184 Date: 8/24/2021 Test Engineer: 19568 Configuration: EUT, X-Position Location: Chamber 1 Mode: NR_16QAM n41 Fundamentals, 30MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>2511.00</td> <td>16.67</td> <td>V</td> <td>5.3</td> <td>10.2</td> <td>21.53</td> <td>33.0</td> <td>-11.5</td> <td></td> </tr> <tr> <td>2511.00</td> <td>22.20</td> <td>H</td> <td>5.3</td> <td>10.2</td> <td>27.06</td> <td>33.0</td> <td>-5.9</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>2593.00</td> <td>21.15</td> <td>V</td> <td>5.4</td> <td>10.0</td> <td>25.81</td> <td>33.0</td> <td>-7.2</td> <td></td> </tr> <tr> <td>2593.00</td> <td>26.20</td> <td>H</td> <td>5.4</td> <td>10.0</td> <td>30.85</td> <td>33.0</td> <td>-2.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>2674.98</td> <td>19.25</td> <td>V</td> <td>5.5</td> <td>10.0</td> <td>23.82</td> <td>33.0</td> <td>-9.2</td> <td></td> </tr> <tr> <td>2674.98</td> <td>25.65</td> <td>H</td> <td>5.5</td> <td>10.0</td> <td>30.22</td> <td>33.0</td> <td>-2.8</td> <td></td> </tr> </tbody> </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									2511.00	16.67	V	5.3	10.2	21.53	33.0	-11.5		2511.00	22.20	H	5.3	10.2	27.06	33.0	-5.9		Mid Ch									2593.00	21.15	V	5.4	10.0	25.81	33.0	-7.2		2593.00	26.20	H	5.4	10.0	30.85	33.0	-2.1		High Ch									2674.98	19.25	V	5.5	10.0	23.82	33.0	-9.2		2674.98	25.65	H	5.5	10.0	30.22	33.0	-2.8
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20MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																									
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NR Band 71

20MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company:		Samsung						
	Project #:		4790047184						
	Date:		8/26/2021						
	Test Engineer:		19568						
	Configuration:		EUT, X-Position						
	Location:		Chamber 1						
	Mode:		LTE_QPSK NR_n71 Fundamentals, 20MHz Bandwidth						
	Test Equipment:								
	Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-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								
	673.00	24.14	V	2.8	-1.2	20.23	34.8	-14.5	
	673.00	26.02	H	2.8	-1.2	22.11	34.8	-12.7	
	Mid Ch								
	680.50	24.14	V	2.8	-1.1	20.24	34.8	-14.5	
	680.50	26.30	H	2.8	-1.1	22.40	34.8	-12.4	
	High Ch								
	688.00	23.75	V	2.8	-1.1	19.87	34.8	-14.9	
	688.00	25.87	H	2.8	-1.1	21.99	34.8	-12.8	

20MHz DFT-s 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company:		Samsung						
	Project #:		4790047184						
	Date:		8/26/2021						
	Test Engineer:		19568						
	Configuration:		EUT, X-Position						
	Location:		Chamber 1						
	Mode:		LTE_16QAM NR_n71 Fundamentals, 20MHz Bandwidth						
	Test Equipment:								
	Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-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								
	673.00	22.95	V	2.8	-1.2	19.04	34.8	-15.7	
	673.00	25.26	H	2.8	-1.2	21.35	34.8	-13.4	
	Mid Ch								
	680.50	23.37	V	2.8	-1.1	19.47	34.8	-15.3	
	680.50	25.18	H	2.8	-1.1	21.28	34.8	-13.5	
	High Ch								
	688.00	23.03	V	2.8	-1.1	19.15	34.8	-15.6	
	688.00	24.98	H	2.8	-1.1	21.10	34.8	-13.7	

15MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790047184 Date: 8/26/2021 Test Engineer: 19568 Configuration: EUT, X-Position Location: Chamber 1 Mode: LTE_QPSK NR_n71 Fundamentals, 15MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-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								
	670.50	24.24	V	2.7	-1.2	20.33	34.8	-14.4	
	670.50	26.08	H	2.7	-1.2	22.17	34.8	-12.6	
	Mid Ch								
	680.50	24.01	V	2.8	-1.1	20.11	34.8	-14.7	
	680.50	26.34	H	2.8	-1.1	22.44	34.8	-12.3	
High Ch									
690.50	23.36	V	2.8	-1.1	19.48	34.8	-15.3		
690.50	25.86	H	2.8	-1.1	21.98	34.8	-12.8		
15MHz DFT-s 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790047184 Date: 8/26/2021 Test Engineer: 19568 Configuration: EUT, X-Position Location: Chamber 1 Mode: LTE_16QAM NR_n71 Fundamentals, 15MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-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								
	670.50	23.52	V	2.7	-1.2	19.61	34.8	-15.2	
	670.50	25.42	H	2.7	-1.2	21.51	34.8	-13.3	
	Mid Ch								
	680.50	23.25	V	2.8	-1.1	19.35	34.8	-15.4	
	680.50	25.72	H	2.8	-1.1	21.82	34.8	-12.9	
High Ch									
690.50	22.30	V	2.8	-1.1	18.42	34.8	-16.4		
690.50	24.98	H	2.8	-1.1	21.10	34.8	-13.7		

10MHz DFT-s QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																									
	<p> Company: Samsung Project #: 4790047184 Date: 8/26/2021 Test Engineer: 19568 Configuration: EUT, X-Position Location: Chamber 1 Mode: LTE_QPSK NR_n71 Fundamentals, 10MHz Bandwidth </p> <p> Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable </p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>668.00</td> <td>23.37</td> <td>V</td> <td>2.7</td> <td>-1.2</td> <td>19.44</td> <td>34.8</td> <td>-15.3</td> <td></td> </tr> <tr> <td>668.00</td> <td>25.86</td> <td>H</td> <td>2.7</td> <td>-1.2</td> <td>21.93</td> <td>34.8</td> <td>-12.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>680.50</td> <td>23.69</td> <td>V</td> <td>2.8</td> <td>-1.1</td> <td>19.79</td> <td>34.8</td> <td>-15.0</td> <td></td> </tr> <tr> <td>680.50</td> <td>26.25</td> <td>H</td> <td>2.8</td> <td>-1.1</td> <td>22.35</td> <td>34.8</td> <td>-12.4</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>693.00</td> <td>24.92</td> <td>V</td> <td>2.8</td> <td>-1.1</td> <td>21.05</td> <td>34.8</td> <td>-13.7</td> <td></td> </tr> <tr> <td>693.00</td> <td>26.16</td> <td>H</td> <td>2.8</td> <td>-1.1</td> <td>22.29</td> <td>34.8</td> <td>-12.5</td> <td></td> </tr> </tbody> </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									668.00	23.37	V	2.7	-1.2	19.44	34.8	-15.3		668.00	25.86	H	2.7	-1.2	21.93	34.8	-12.8		Mid Ch									680.50	23.69	V	2.8	-1.1	19.79	34.8	-15.0		680.50	26.25	H	2.8	-1.1	22.35	34.8	-12.4		High Ch									693.00	24.92	V	2.8	-1.1	21.05	34.8	-13.7		693.00	26.16	H	2.8	-1.1	22.29	34.8	-12.5
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9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

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 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.

(m) (4) 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.

Part 90.691:

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03r01

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) Sweep time = auto couple;
- d) Detector = rms;
- e) Ensure that the number of measurement points \geq span/RBW;
- f) Trace mode = average(FDD), Max hold(TDD);

NOTE

5GNR: All waveforms(CP-OFDM vs DFT-OFDM) were investigated to determine the worst case configuration. All mode of operation were investigated and the worst case configuration results are reported in tis section.

RESULTS

See the following pages.

NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE.

9.6.1. SPURIOUS RADIATION PLOTS

LTE Band 25

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
		Company:	Samsung								
		Project #:	4790047184								
		Date:	8/23/2021								
		Test Engineer:	20890								
		Configuration:	EUT / AC Adapter, X-Position								
		Location:	Chamber 2								
		Mode:	LTE_QPSK Band 25 Harmonics, 5MHz Bandwidth								
		Test Voltage:	AC 120 V, 60 Hz								
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	-11.5	V	3.0	42.1	1.0	-52.6	-13.0	-39.6			
5557.50	-8.1	V	3.0	42.9	1.0	-50.0	-13.0	-37.0			
7410.00	-6.2	V	3.0	42.5	1.0	-47.7	-13.0	-34.7			
3705.00	-11.5	H	3.0	42.1	1.0	-52.5	-13.0	-39.5			
5557.50	-7.9	H	3.0	42.9	1.0	-49.8	-13.0	-36.8			
7410.00	-6.4	H	3.0	42.5	1.0	-47.9	-13.0	-34.9			
Mid Ch, 1882.5MHz											
3765.00	-11.4	V	3.0	42.1	1.0	-52.5	-13.0	-39.5			
5647.50	-7.8	V	3.0	42.9	1.0	-49.7	-13.0	-36.7			
7530.00	-6.4	V	3.0	42.4	1.0	-47.8	-13.0	-34.8			
3765.00	-11.5	H	3.0	42.1	1.0	-52.6	-13.0	-39.6			
5647.50	-7.4	H	3.0	42.9	1.0	-49.4	-13.0	-36.4			
7530.00	-6.6	H	3.0	42.4	1.0	-48.0	-13.0	-35.0			
High Ch, 1912.5MHz											
3825.00	-11.4	V	3.0	42.1	1.0	-52.5	-13.0	-39.5			
5737.50	-8.1	V	3.0	43.0	1.0	-50.0	-13.0	-37.0			
7650.00	-6.3	V	3.0	42.4	1.0	-47.7	-13.0	-34.7			
3825.00	-11.4	H	3.0	42.1	1.0	-52.5	-13.0	-39.5			
5737.50	-7.8	H	3.0	43.0	1.0	-49.7	-13.0	-36.7			
7650.00	-6.5	H	3.0	42.4	1.0	-47.8	-13.0	-34.8			

LTE Band 26 (Part 90)

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
5MHz QPSK	Company: Samsung										
	Project #: 4790047184										
	Date: 8/26/2021										
	Test Engineer: 22943										
	Configuration: EUT / AC Adapter, X-Position										
	Location: Chamber 2										
	Mode: LTE_QPSK Band 26 Harmonics, 5MHz Bandwidth										
	Test Voltage: AC 120 V, 60 Hz										
	Low Ch, 816.5MHz										
		1633.00	-15.6	V	3.0	40.7	1.0	-55.3	-13.0	-42.3	
		2449.50	-12.2	V	3.0	41.3	1.0	-52.5	-13.0	-39.5	
		3266.00	-9.5	V	3.0	42.1	1.0	-50.5	-13.0	-37.5	
		1633.00	-15.7	H	3.0	40.7	1.0	-55.4	-13.0	-42.4	
		2449.50	-12.3	H	3.0	41.3	1.0	-52.6	-13.0	-39.6	
		3266.00	-9.4	H	3.0	42.1	1.0	-50.5	-13.0	-37.5	
	Mid Ch, 821.5MHz										
		1643.00	-15.5	V	3.0	40.7	1.0	-55.2	-13.0	-42.2	
		2464.50	-12.1	V	3.0	41.3	1.0	-52.4	-13.0	-39.4	
	3286.00	-8.9	V	3.0	42.1	1.0	-50.0	-13.0	-37.0		
	1643.00	-15.6	H	3.0	40.7	1.0	-55.3	-13.0	-42.3		
	2464.50	-12.3	H	3.0	41.3	1.0	-52.5	-13.0	-39.5		
	3286.00	-9.4	H	3.0	42.1	1.0	-50.4	-13.0	-37.4		

LTE Band 26 (Straddle)

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
10MHz QPSK	Company: Samsung										
	Project #: 4790047184										
	Date: 8/26/2021										
	Test Engineer: 22943										
	Configuration: EUT / AC Adapter, X-Position										
	Location: Chamber 2										
	Mode: LTE_QPSK Band 26 Harmonics, 10MHz Bandwidth										
	Test Voltage: AC 120 V, 60 Hz										
	Low Ch, 824MHz										
		1648.00	-15.7	V	3.0	40.7	1.0	-55.4	-13.0	-42.4	
		2472.00	-12.4	V	3.0	41.3	1.0	-52.7	-13.0	-39.7	
		3296.00	-9.5	V	3.0	42.1	1.0	-50.6	-13.0	-37.6	
	1648.00	-15.7	H	3.0	40.7	1.0	-55.4	-13.0	-42.4		
	2472.00	-12.4	H	3.0	41.3	1.0	-52.7	-13.0	-39.7		
	3296.00	-9.6	H	3.0	42.1	1.0	-50.7	-13.0	-37.7		

LTE Band 26 (Part 22)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
10MHz QPSK		Company: Samsung Project #: 4790047184 Date: 8/26/2021 Test Engineer: 22943 Configuration: EUT / AC Adapter, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Harmonics, 10MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		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	-15.8	V	3.0	40.7	1.0	-55.5	-13.0	-42.5	
		2487.00	-12.7	V	3.0	41.3	1.0	-53.0	-13.0	-40.0	
		3316.00	-9.7	V	3.0	42.1	1.0	-50.8	-13.0	-37.8	
		1658.00	-15.6	H	3.0	40.7	1.0	-55.2	-13.0	-42.2	
		2487.00	-12.3	H	3.0	41.3	1.0	-52.7	-13.0	-39.7	
		3316.00	-10.4	H	3.0	42.1	1.0	-51.4	-13.0	-38.4	
		Mid Ch, 831.5MHz									
1663.00	-15.6	V	3.0	40.7	1.0	-55.3	-13.0	-42.3			
2494.50	-12.4	V	3.0	41.3	1.0	-52.7	-13.0	-39.7			
3326.00	-9.5	V	3.0	42.1	1.0	-50.6	-13.0	-37.6			
1663.00	-15.2	H	3.0	40.7	1.0	-54.9	-13.0	-41.9			
2494.50	-11.8	H	3.0	41.3	1.0	-52.1	-13.0	-39.1			
3326.00	-8.9	H	3.0	42.1	1.0	-50.0	-13.0	-37.0			
High Ch, 844MHz											
1688.00	-15.6	V	3.0	40.7	1.0	-55.3	-13.0	-42.3			
2532.00	-12.5	V	3.0	41.4	1.0	-52.8	-13.0	-39.8			
3376.00	-9.5	V	3.0	42.1	1.0	-50.5	-13.0	-37.5			
1688.00	-15.5	H	3.0	40.7	1.0	-55.2	-13.0	-42.2			
2532.00	-12.2	H	3.0	41.4	1.0	-52.6	-13.0	-39.6			
3376.00	-9.4	H	3.0	42.1	1.0	-50.5	-13.0	-37.5			

LTE Band 41

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790047184							
Date:		8/24/2021							
Test Engineer:		20890							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2506MHz									
5012.00	-13.9	V	3.0	42.8	1.0	-55.7	-25.0	-30.7	
7518.00	-3.5	V	3.0	42.4	1.0	-44.9	-25.0	-19.9	
10024.00	-15.7	V	3.0	40.9	1.0	-55.5	-25.0	-30.5	
12530.00	-11.2	V	3.0	42.1	1.0	-52.3	-25.0	-27.3	
15036.00	-7.8	V	3.0	43.7	1.0	-50.5	-25.0	-25.5	
5012.00	-18.1	H	3.0	42.8	1.0	-59.9	-25.0	-34.9	
7518.00	-10.1	H	3.0	42.4	1.0	-51.5	-25.0	-26.5	
10024.00	-15.6	H	3.0	40.9	1.0	-55.4	-25.0	-30.4	
12530.00	-11.2	H	3.0	42.1	1.0	-52.2	-25.0	-27.2	
15036.00	-7.8	H	3.0	43.7	1.0	-50.5	-25.0	-25.5	
Mid Ch, 2593MHz									
5186.00	-14.8	V	3.0	42.8	1.0	-56.6	-25.0	-31.6	
7779.00	-18.8	V	3.0	42.3	1.0	-60.1	-25.0	-35.1	
10372.00	-15.5	V	3.0	41.0	1.0	-55.5	-25.0	-30.5	
12965.00	-10.9	V	3.0	42.4	1.0	-52.3	-25.0	-27.3	
15558.00	-8.0	V	3.0	43.5	1.0	-50.6	-25.0	-25.6	
5186.00	-17.8	H	3.0	42.8	1.0	-59.6	-25.0	-34.6	
7779.00	-19.0	H	3.0	42.3	1.0	-60.3	-25.0	-35.3	
10372.00	-16.6	H	3.0	41.0	1.0	-56.6	-25.0	-31.6	
12965.00	-10.9	H	3.0	42.4	1.0	-52.3	-25.0	-27.3	
15558.00	-7.7	H	3.0	43.5	1.0	-50.3	-25.0	-25.3	
High Ch, 2680MHz									
5360.00	-17.4	V	3.0	42.9	1.0	-59.3	-25.0	-34.3	
8040.00	-18.5	V	3.0	42.2	1.0	-59.7	-25.0	-34.7	
10720.00	-14.3	V	3.0	41.2	1.0	-54.5	-25.0	-29.5	
13400.00	-10.2	V	3.0	42.6	1.0	-51.9	-25.0	-26.9	
16080.00	-7.3	V	3.0	43.4	1.0	-49.7	-25.0	-24.7	
5360.00	-18.6	H	3.0	42.9	1.0	-60.5	-25.0	-35.5	
8040.00	-18.7	H	3.0	42.2	1.0	-59.9	-25.0	-34.9	
10720.00	-14.3	H	3.0	41.2	1.0	-54.4	-25.0	-29.4	
13400.00	-10.2	H	3.0	42.6	1.0	-51.9	-25.0	-26.9	
16080.00	-7.4	H	3.0	43.4	1.0	-49.7	-25.0	-24.7	

20MHz
QPSK

LTE Band 71

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
5MHz QPSK		Company: Samsung Project #: 4790047184 Date: 8/12/2021 Test Engineer: 19568 Configuration: EUT / AC Adapter, Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 71 Harmonics, 5MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Low Ch, 665.5MHz									
		1331.00	-15.1	V	3.0	45.5	1.0	-59.6	-13.0	-46.6	
		1996.50	-11.6	V	3.0	45.0	1.0	-55.6	-13.0	-42.6	
		2662.00	-10.6	V	3.0	45.1	1.0	-54.7	-13.0	-41.7	
		1331.00	-16.7	H	3.0	45.5	1.0	-61.2	-13.0	-48.2	
		1996.50	-13.5	H	3.0	45.0	1.0	-57.5	-13.0	-44.5	
		2662.00	-10.9	H	3.0	45.1	1.0	-55.1	-13.0	-42.1	
		Mid Ch, 680.5MHz									
1361.00	-15.2	V	3.0	45.5	1.0	-59.7	-13.0	-46.7			
2041.50	-11.5	V	3.0	45.0	1.0	-55.5	-13.0	-42.5			
2722.00	-10.4	V	3.0	45.1	1.0	-54.5	-13.0	-41.5			
1361.00	-16.7	H	3.0	45.5	1.0	-61.2	-13.0	-48.2			
2041.50	-13.1	H	3.0	45.0	1.0	-57.1	-13.0	-44.1			
2722.00	-10.5	H	3.0	45.1	1.0	-54.6	-13.0	-41.6			
High Ch, 695.5MHz											
1391.00	-15.0	V	3.0	45.5	1.0	-59.5	-13.0	-46.5			
2086.50	-11.5	V	3.0	45.0	1.0	-55.5	-13.0	-42.5			
2782.00	-10.2	V	3.0	45.2	1.0	-54.4	-13.0	-41.4			
1391.00	-16.8	H	3.0	45.5	1.0	-61.3	-13.0	-48.3			
2086.50	-13.0	H	3.0	45.0	1.0	-57.0	-13.0	-44.0			
2782.00	-10.3	H	3.0	45.2	1.0	-54.5	-13.0	-41.5			

NR Band 25

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790047184							
Date:		8/26/2021							
Test Engineer:		19568							
Configuration:		EUT / AC Adapter, Y-Position							
Location:		Chamber 1							
Mode:		NR_QPSK n25 Harmonics, 5MHz Bandwidth							
Test Votage:		AC 120 V, 60 Hz							
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	-11.5	V	3.0	45.5	1.0	-56.0	-13.0	-43.0	
5557.50	-9.1	V	3.0	45.4	1.0	-53.5	-13.0	-40.5	
7410.00	-6.3	V	3.0	44.2	1.0	-49.5	-13.0	-36.5	
3705.00	-11.2	H	3.0	45.5	1.0	-55.7	-13.0	-42.7	
5557.50	-9.2	H	3.0	45.4	1.0	-53.6	-13.0	-40.6	
7410.00	-6.2	H	3.0	44.2	1.0	-49.4	-13.0	-36.4	
Mid Ch, 1882.5MHz									
3765.00	-11.4	V	3.0	45.5	1.0	-55.9	-13.0	-42.9	
5647.50	-9.0	V	3.0	45.4	1.0	-53.4	-13.0	-40.4	
7530.00	-6.5	V	3.0	44.1	1.0	-49.6	-13.0	-36.6	
3765.00	-11.3	H	3.0	45.5	1.0	-55.7	-13.0	-42.7	
5647.50	-8.9	H	3.0	45.4	1.0	-53.3	-13.0	-40.3	
7530.00	-6.3	H	3.0	44.1	1.0	-49.5	-13.0	-36.5	
High Ch, 1912.5MHz									
3825.00	-11.3	V	3.0	45.5	1.0	-55.8	-13.0	-42.8	
5737.50	-9.0	V	3.0	45.4	1.0	-53.4	-13.0	-40.4	
7650.00	-6.0	V	3.0	44.1	1.0	-49.0	-13.0	-36.0	
3825.00	-11.3	H	3.0	45.5	1.0	-55.8	-13.0	-42.8	
5737.50	-8.9	H	3.0	45.4	1.0	-53.3	-13.0	-40.3	
7650.00	-5.9	H	3.0	44.1	1.0	-49.0	-13.0	-36.0	

5MHz
DFT-s
QPSK

NR Band 41

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
30MHz DFT-s QPSK		Company: Samsung Project #: 4790047184 Date: 8/24/2021 Test Engineer: 19568 Configuration: EUT , X-Position Location: Chamber 1 Mode: NR_QPSK n41 Harmonics, 30MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Low Ch, 2511MHz									
		5022.00	-18.3	V	3.0	45.5	1.0	-62.7	-25.0	-37.7	
		7533.00	-11.7	V	3.0	44.1	1.0	-54.8	-25.0	-29.8	
		10044.00	-6.5	V	3.0	42.3	1.0	-47.8	-25.0	-22.8	
		5022.00	-17.3	H	3.0	45.5	1.0	-61.7	-25.0	-36.7	
		7533.00	-11.9	H	3.0	44.1	1.0	-55.0	-25.0	-30.0	
		10044.00	-11.5	H	3.0	42.3	1.0	-52.8	-25.0	-27.8	
		Mid Ch, 2593MHz									
5186.00	-17.8	V	3.0	45.4	1.0	-62.3	-25.0	-37.3			
7779.00	-15.5	V	3.0	44.0	1.0	-58.5	-25.0	-33.5			
10372.00	-5.4	V	3.0	42.4	1.0	-46.7	-25.0	-21.7			
5186.00	-16.0	H	3.0	45.4	1.0	-60.4	-25.0	-35.4			
7779.00	-15.5	H	3.0	44.0	1.0	-58.6	-25.0	-33.6			
10372.00	-0.5	H	3.0	42.4	1.0	-41.9	-25.0	-16.9			
High Ch, 2674.98MHz											
5349.96	-15.7	V	3.0	45.4	1.0	-60.1	-25.0	-35.1			
8024.94	-17.3	V	3.0	43.9	1.0	-60.1	-25.0	-35.1			
10699.92	-11.9	V	3.0	42.5	1.0	-53.4	-25.0	-28.4			
5349.96	-13.9	H	3.0	45.4	1.0	-58.3	-25.0	-33.3			
8024.94	-17.5	H	3.0	43.9	1.0	-60.3	-25.0	-35.3			
10699.92	-11.3	H	3.0	42.5	1.0	-52.8	-25.0	-27.8			

NR Band 71

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
20MHz DFT-s QPSK		Company: Samsung Project #: 4790047184 Date: 8/26/2021 Test Engineer: 19568 Configuration: EUT / AC Adpater, X-Position Location: Chamber 1 Mode: LTE_QPSK NR_n71 Harmonics, 20MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Low Ch, 673MHz									
		1346.00	-15.5	V	3.0	45.5	1.0	-60.1	-13.0	-47.1	
		2019.00	-11.6	V	3.0	45.0	1.0	-55.6	-13.0	-42.6	
		2692.00	-10.3	V	3.0	45.1	1.0	-54.5	-13.0	-41.5	
		1346.00	-13.4	H	3.0	45.5	1.0	-57.9	-13.0	-44.9	
		2019.00	-13.3	H	3.0	45.0	1.0	-57.3	-13.0	-44.3	
		2692.00	0.0	H	3.0	45.1	1.0	-44.1	-13.0	-31.1	
		Mid Ch, 680.5MHz									
1361.00	-14.8	V	3.0	45.5	1.0	-59.3	-13.0	-46.3			
2041.50	-11.5	V	3.0	45.0	1.0	-55.5	-13.0	-42.5			
2722.00	-10.2	V	3.0	45.1	1.0	-54.4	-13.0	-41.4			
1361.00	-11.8	H	3.0	45.5	1.0	-56.3	-13.0	-43.3			
2041.50	-13.1	H	3.0	45.0	1.0	-57.1	-13.0	-44.1			
2722.00	-10.5	H	3.0	45.1	1.0	-54.6	-13.0	-41.6			
High Ch, 688MHz											
1376.00	-15.5	V	3.0	45.5	1.0	-60.0	-13.0	-47.0			
2064.00	-11.8	V	3.0	45.0	1.0	-55.8	-13.0	-42.8			
2752.00	-10.1	V	3.0	45.2	1.0	-54.2	-13.0	-41.2			
1376.00	-15.8	H	3.0	45.5	1.0	-60.3	-13.0	-47.3			
2064.00	-13.2	H	3.0	45.0	1.0	-57.2	-13.0	-44.2			
2752.00	-10.7	H	3.0	45.2	1.0	-54.9	-13.0	-41.9			

END OF TEST REPORT