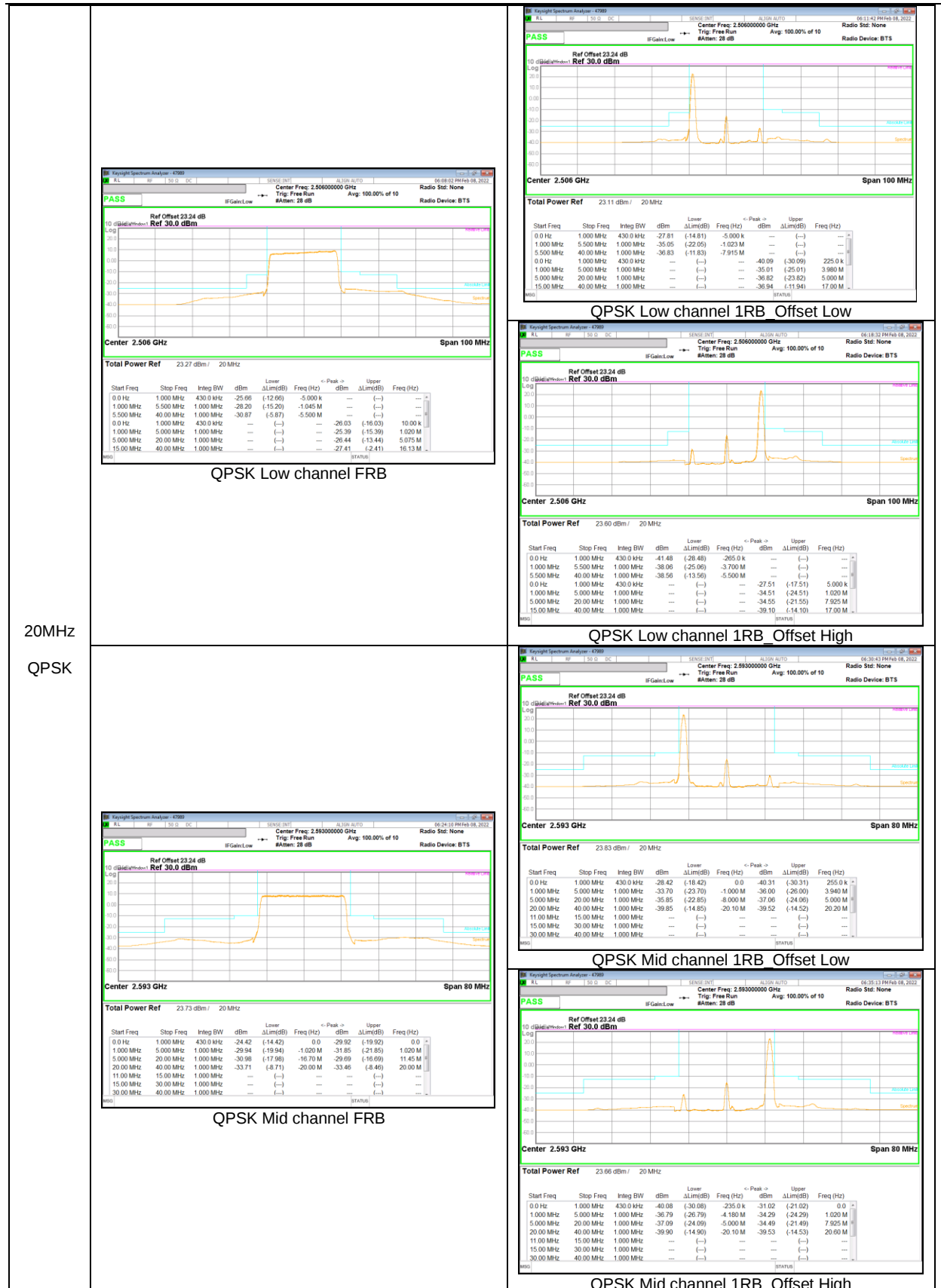
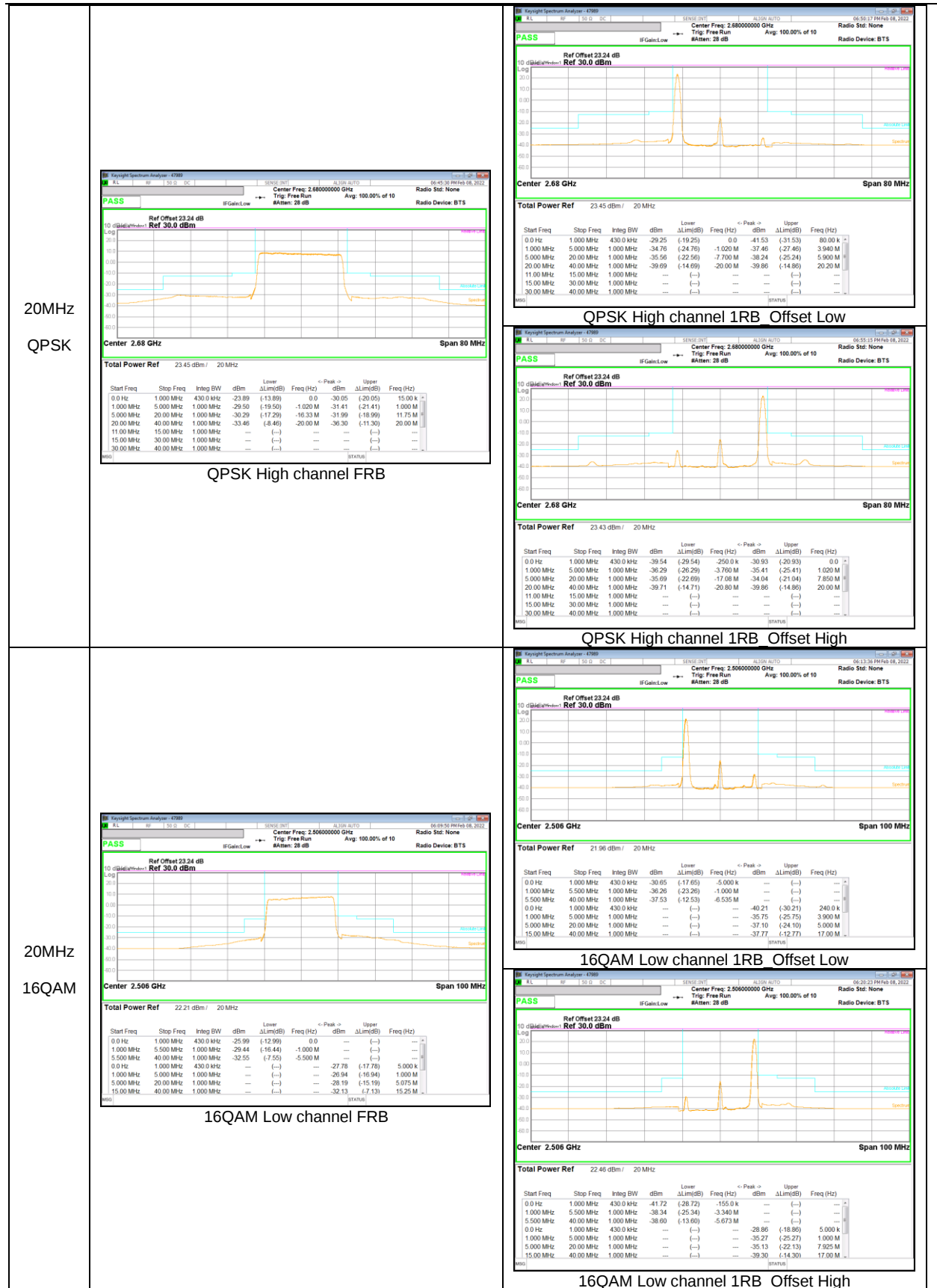
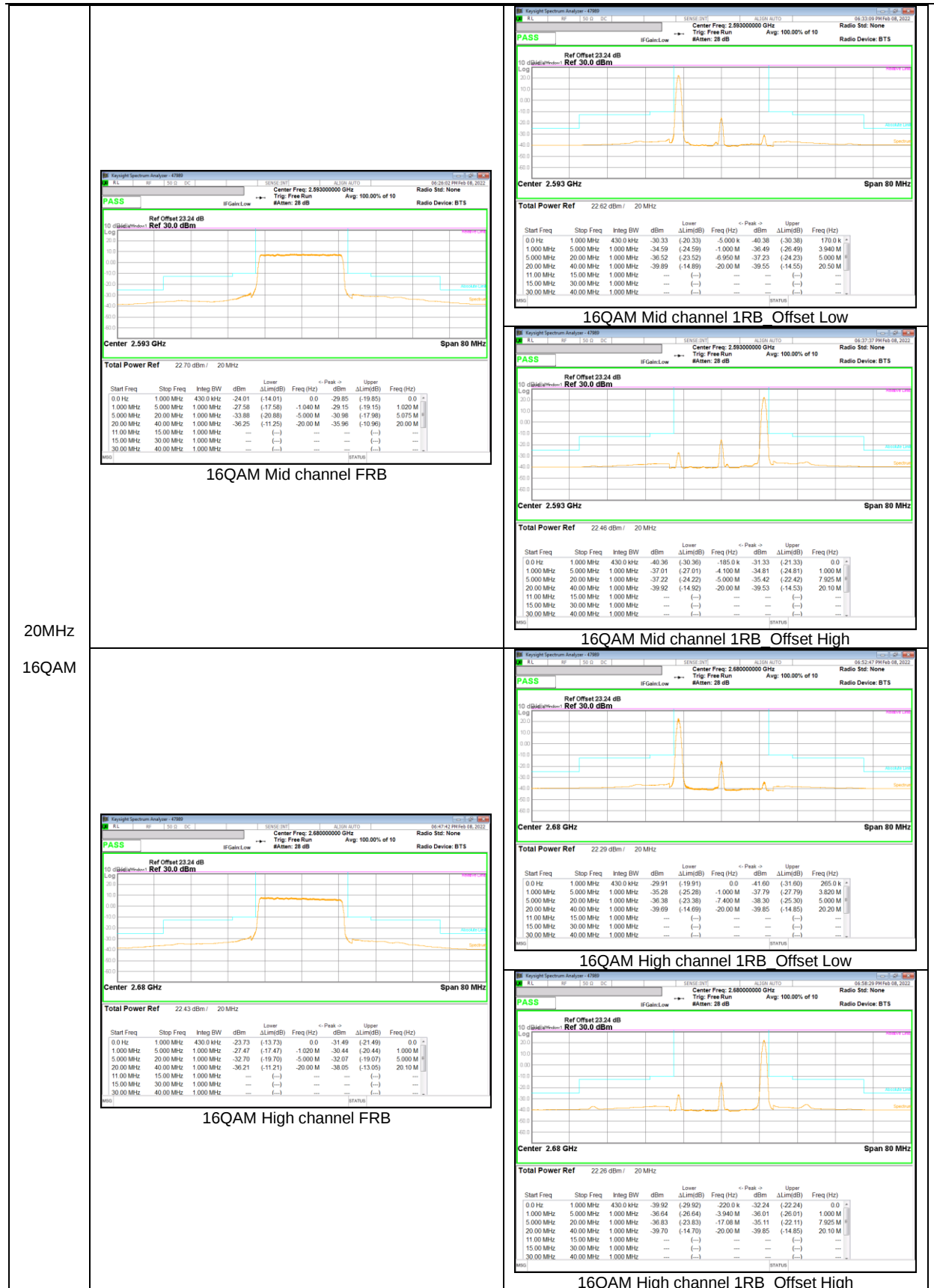
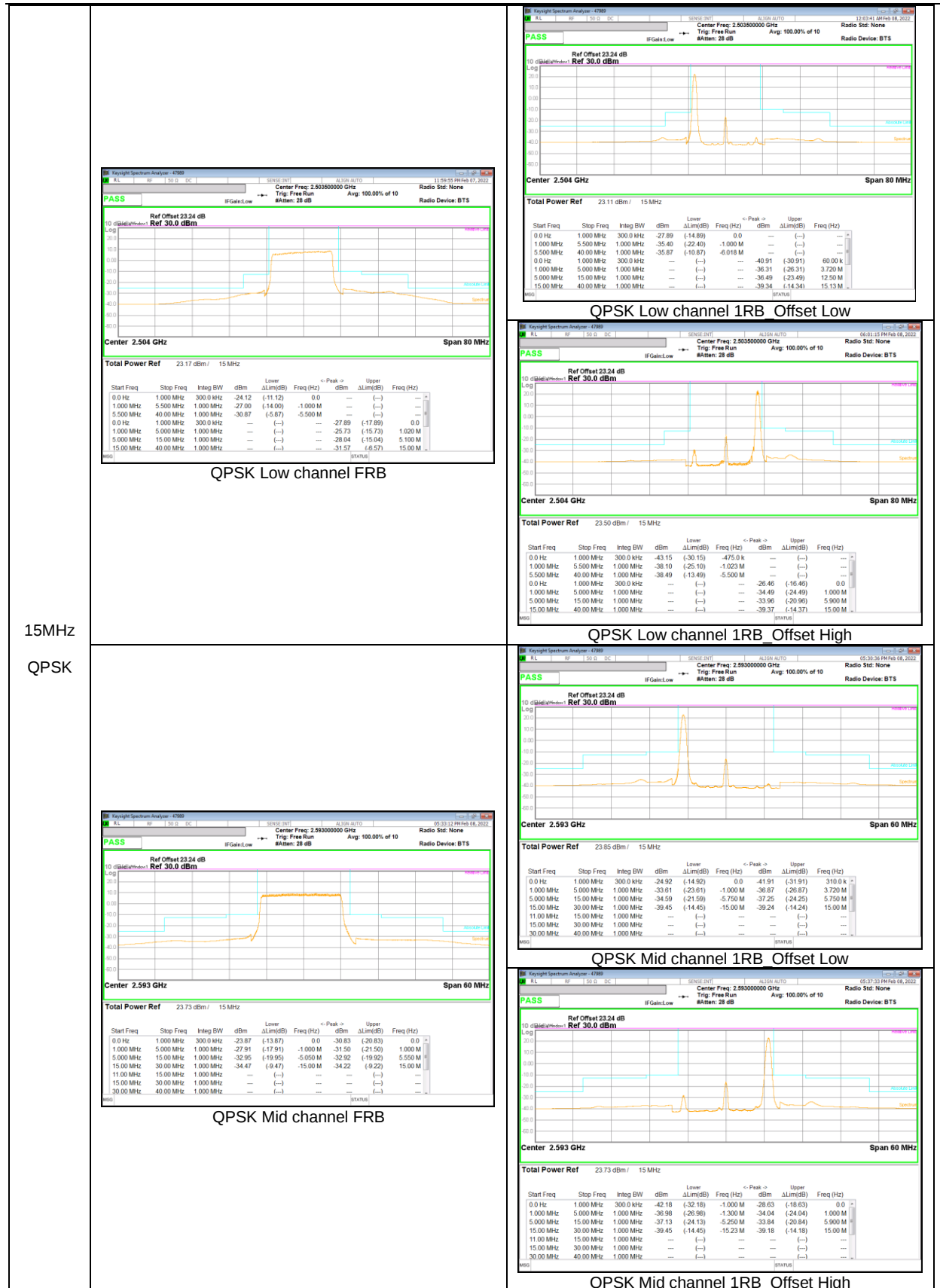


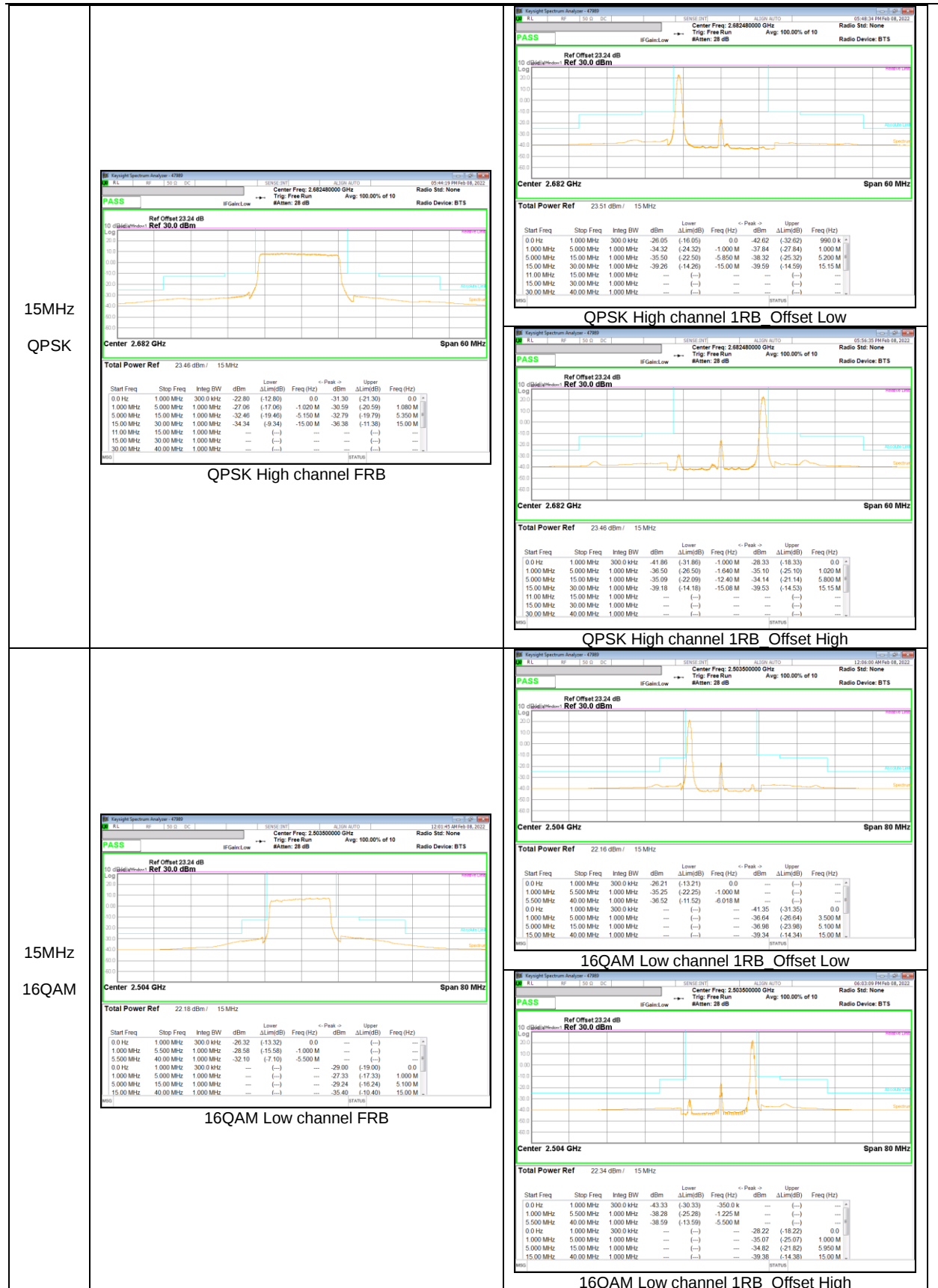




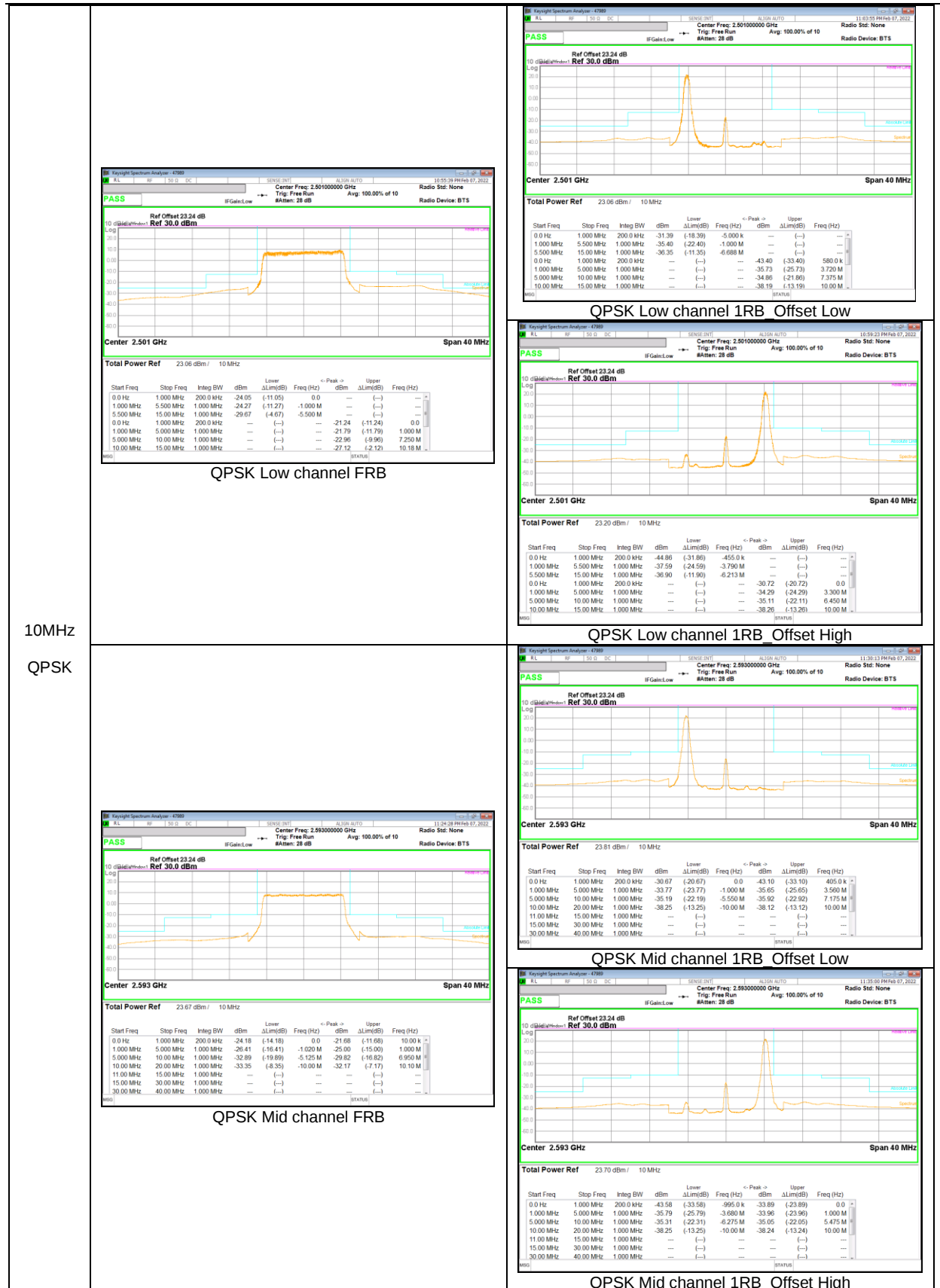


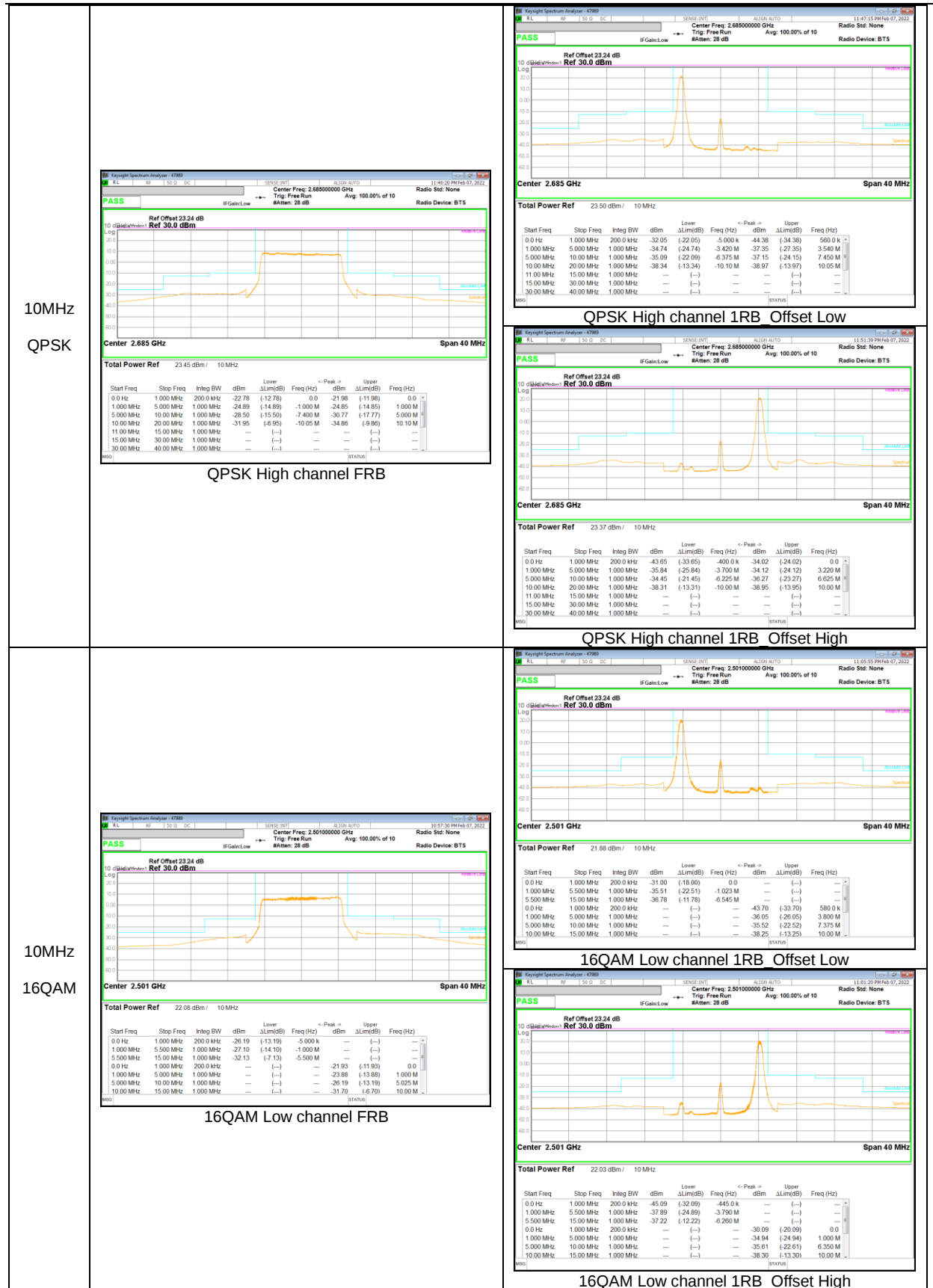














9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §24.238 and §27.53

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:

(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.

(l)(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

(n)(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

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) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points = Max (40001);
- g) Trace mode = average(5G NR FDD), Maxhold(5G NR TDD);

RESULTS

See the following pages.

NOTE1

5G NR: All Waveforms (CP-OFDM vs DFT-s OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

NOTE2

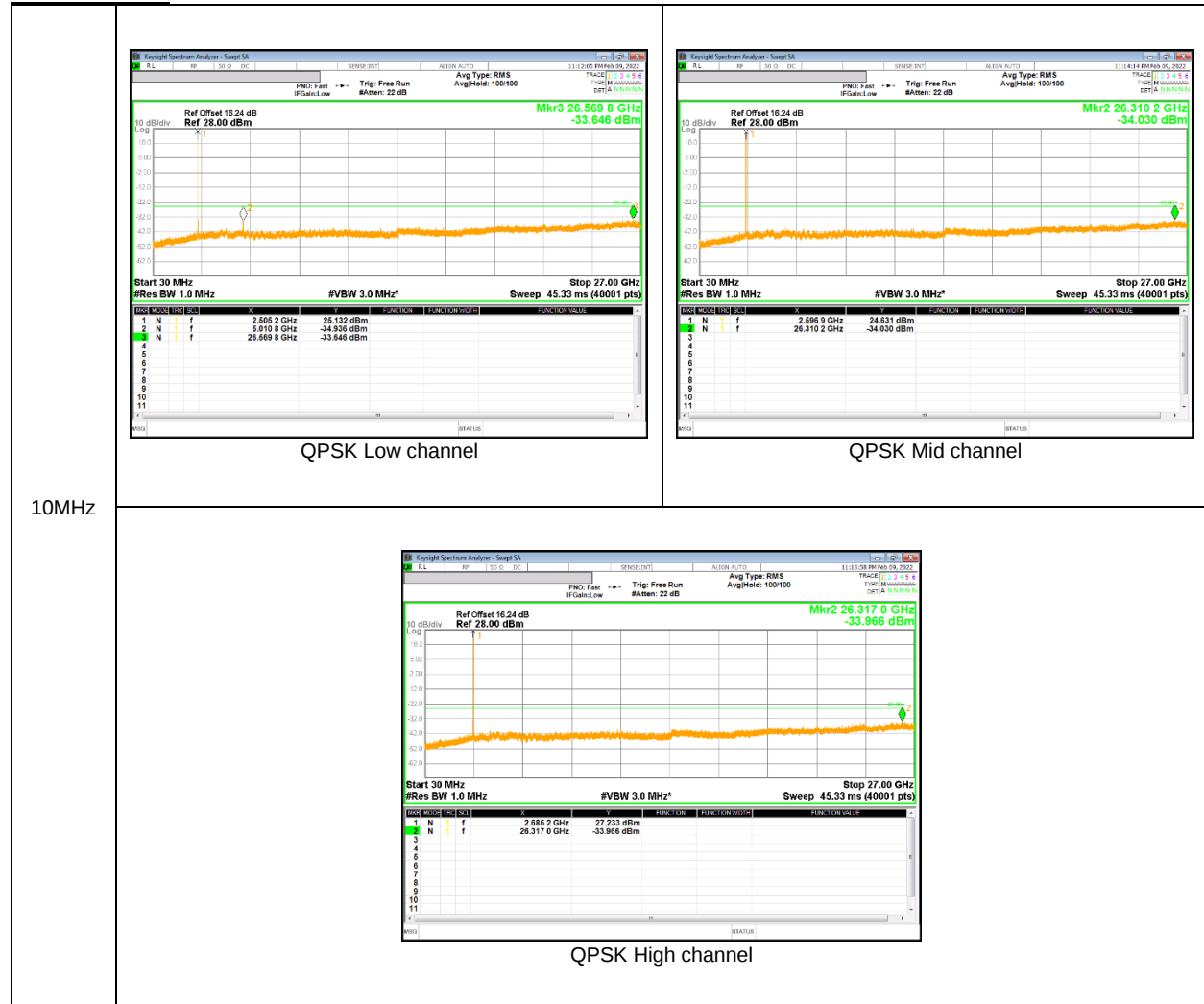
Please refer to section 5.4 for bandwidth and RB setting about 5G NR bands.

9.3.1. OUT OF BAND EMISSIONS RESULT

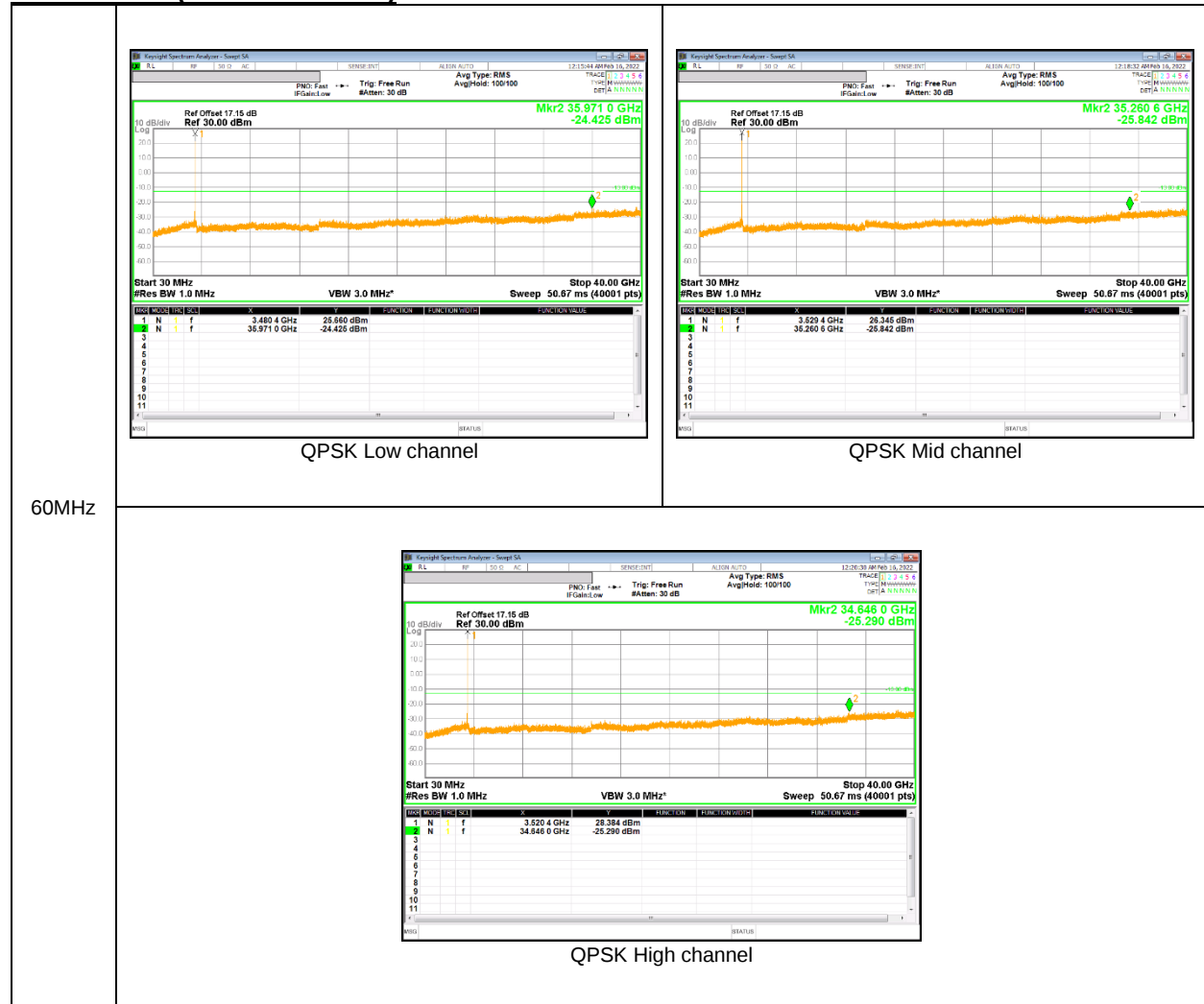
NR Band n25



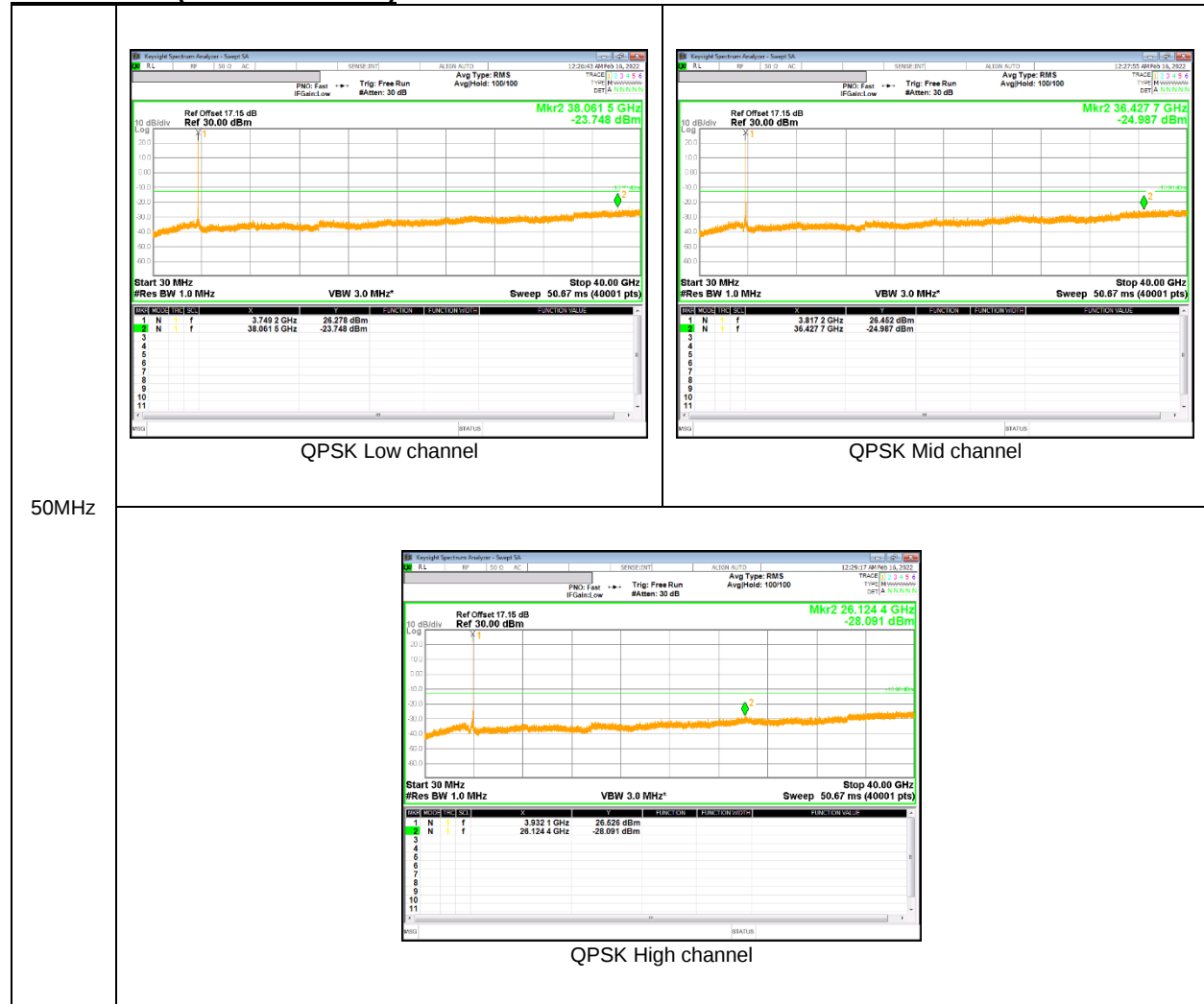
NR Band n41



NR Band n77 (3450 – 3550 MHz)



NR Band n77 (3700 – 3980 MHz)



9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §24.235 and §27.54

LIMITS

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

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

NR Band n25 (Lowest Frequency: QPSK / 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	1850.2562	1909.7407		
Extreme (50C)		1850.2562	1909.7407	39.3	0.021
Extreme (40C)		1850.2562	1909.7407	40.3	0.021
Extreme (30C)		1850.2562	1909.7407	38.8	0.021
Extreme (10C)		1850.2562	1909.7407	41.3	0.022
Extreme (0C)		1850.2562	1909.7407	42.1	0.022
Extreme (-10C)		1850.2562	1909.7407	48.3	0.026
Extreme (-20C)		1850.2562	1909.7407	46.2	0.025
Extreme (-30C)		1850.2562	1909.7407	47.3	0.025
20C	15%	1850.2562	1909.7407	20.8	0.011
	-15%	1850.2562	1909.7407	21.8	0.012
	End Point	1850.2562	1909.7407	19.3	0.010

NR Band n41 (Lowest Frequency:16QAM / Highest Frequency: 16QAM)

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	2496.6824	2689.2952		
Extreme (50C)		2496.6824	2689.2952	30.8	0.012
Extreme (40C)		2496.6824	2689.2952	30.5	0.012
Extreme (30C)		2496.6824	2689.2952	31.4	0.012
Extreme (10C)		2496.6824	2689.2952	33.7	0.013
Extreme (0C)		2496.6824	2689.2952	34.3	0.013
Extreme (-10C)		2496.6824	2689.2952	29.5	0.011
Extreme (-20C)		2496.6824	2689.2952	29.9	0.012
Extreme (-30C)		2496.6824	2689.2952	30.5	0.012
20C	15%	2496.6824	2689.2952	18.3	0.007
	-15%	2496.6824	2689.2952	19.3	0.007
	End Point	2496.6824	2689.2952	19.7	0.008

NR Band n77 (Lowest Frequency:16QAM / Highest Frequency: 16QAM)

Limit		3450	3550	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3450.6845	3549.3194		
Extreme (50C)		3450.6845	3549.3194	29.6	0.008
Extreme (40C)		3450.6845	3549.3194	28.8	0.008
Extreme (30C)		3450.6845	3549.3194	27.1	0.008
Extreme (10C)		3450.6845	3549.3194	26.9	0.008
Extreme (0C)		3450.6845	3549.3194	28.4	0.008
Extreme (-10C)		3450.6845	3549.3194	29.4	0.008
Extreme (-20C)		3450.6845	3549.3194	27.4	0.008
Extreme (-30C)		3450.6845	3549.3194	26.7	0.008
20C	15%	3450.6845	3549.3194	21.0	0.006
	-15%	3450.6845	3549.3194	22.4	0.006
	End Point	3450.6845	3549.3194	20.4	0.006
Limit		3700	3980	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3700.6951	3979.3172		
Extreme (50C)		3700.6951	3979.3172	31.5	0.008
Extreme (40C)		3700.6951	3979.3172	33.1	0.009
Extreme (30C)		3700.6951	3979.3172	32.9	0.009
Extreme (10C)		3700.6951	3979.3172	30.1	0.008
Extreme (0C)		3700.6951	3979.3172	29.5	0.008
Extreme (-10C)		3700.6951	3979.3172	33.2	0.009
Extreme (-20C)		3700.6951	3979.3172	31.2	0.008
Extreme (-30C)		3700.6951	3979.3172	30.9	0.008
20C	15%	3700.6951	3979.3172	27.4	0.007
	-15%	3700.6951	3979.3172	26.3	0.007
	End Point	3700.6951	3979.3172	29.0	0.008

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §24.232 and §27.50

LIMITS

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) 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.

(j)(3) Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(k)(3) Mobile devices are limited to 1Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

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

TEST PROCEDURE

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

For radiated output power measurement with a ESU40:

- a) Set the RBW $\geq$ OBW;
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span $\geq 2 \times$ RBW;
- d) Sweep time = auto couple or 1 second;
- e) Detector = rms;
- f) Ensure that the number of measurement points $\geq$ span/RBW;
- g) Trace mode = average;

TEST RESULTS

9.5.1. ERP/EIRP Results

NR Band n25

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n25	20	DFT-s OFDM	QPSK	1/1	1860.0	22.67	184.93
				1/1	1882.5	23.35	216.27
				1/53	1905.0	23.42	219.79
			16QAM	1/1	1860.0	21.74	149.28
				1/1	1882.5	22.01	158.85
				1/53	1905.0	22.36	172.19
	15	DFT-s OFDM	QPSK	1/1	1857.5	22.62	182.81
				1/1	1882.5	22.82	191.43
				1/77	1907.5	22.65	184.08
			16QAM	1/1	1857.5	21.67	146.89
				1/1	1882.5	21.89	154.53
				1/77	1907.5	21.65	146.22
	10	DFT-s OFDM	QPSK	1/26	1855.0	22.53	179.06
				1/1	1882.5	22.95	197.24
				1/50	1910.0	22.79	190.11
			16QAM	1/26	1855.0	21.31	135.21
				1/1	1882.5	22.05	160.32
				1/50	1910.0	21.55	142.89
	5	DFT-s OFDM	QPSK	1/1	1852.5	22.53	179.06
				1/1	1882.5	23.16	207.01
				1/23	1912.5	22.88	194.09
			16QAM	1/1	1852.5	21.52	141.91
				1/1	1882.5	21.94	156.31
				1/23	1912.5	21.93	155.96

NR Band n41

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n41	100	DFT-s OFDM	QPSK	1/137	2546.0	21.43	139.00
				1/271	2593.0	22.37	172.58
				1/137	2640.0	21.20	131.83
			16QAM	1/137	2546.0	20.33	107.89
				1/271	2593.0	22.15	164.06
				1/137	2640.0	20.36	108.64
	90	DFT-s OFDM	QPSK	1/243	2541.0	24.48	280.54
				1/123	2593.0	24.10	257.04
				1/123	2645.0	23.01	199.99
			16QAM	1/243	2541.0	23.40	218.78
				1/123	2593.0	22.80	190.55
				1/123	2645.0	22.39	173.38
	80	DFT-s OFDM	QPSK	1/215	2536.0	23.25	211.35
				1/109	2594.0	23.47	222.33
				1/1	2650.0	23.46	221.82
			16QAM	1/215	2536.0	22.12	162.93
				1/109	2594.0	23.08	203.24
				1/1	2650.0	22.84	192.31
	60	DFT-s OFDM	QPSK	1/1	2526.0	23.81	240.44
				1/81	2593.0	23.87	243.78
				1/160	2660.0	21.85	153.11
			16QAM	1/1	2526.0	23.64	231.21
				1/81	2593.0	23.00	199.53
				1/160	2660.0	21.36	136.77
	50	DFT-s OFDM	QPSK	1/67	2521.0	24.45	278.61
				1/1	2593.0	24.60	288.40
				1/1	2665.0	24.26	266.69
			16QAM	1/67	2521.0	23.05	201.84
				1/1	2593.0	24.30	269.15
				1/1	2665.0	23.53	225.42
	40	DFT-s OFDM	QPSK	1/1	2516.0	23.83	241.55
				1/53	2593.0	21.53	142.23
				1/1	2670.0	23.88	244.34
			16QAM	1/1	2516.0	22.65	184.08
				1/53	2593.0	20.90	123.03
				1/1	2670.0	21.83	152.41

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n41	30	DFT-s OFDM	QPSK	1/39	2511.0	24.10	257.04
				1/1	2593.0	24.31	269.77
				1/76	2675.0	23.28	212.81
			16QAM	1/39	2511.0	23.59	228.56
				1/1	2593.0	23.88	244.34
				1/76	2675.0	22.16	164.44
	20	DFT-s OFDM	QPSK	1/1	2506.0	23.71	234.96
				1/26	2593.0	24.18	261.82
				1/26	2680.0	23.12	205.12
			16QAM	1/1	2506.0	23.44	220.80
				1/26	2593.0	23.26	211.84
				1/26	2680.0	22.79	190.11
	15	DFT-s OFDM	QPSK	1/19	2503.5	24.42	276.69
				1/36	2593.0	23.98	250.03
				1/1	2682.5	23.33	215.28
			16QAM	1/19	2503.5	23.55	226.46
				1/36	2593.0	22.76	188.80
				1/1	2682.5	22.49	177.42
	10	DFT-s OFDM	QPSK	1/22	2501.0	24.02	252.35
				1/22	2593.0	23.71	234.96
				1/12	2685.0	22.30	169.82
			16QAM	1/22	2501.0	22.51	178.24
				1/22	2593.0	22.85	192.75
				1/12	2685.0	21.11	129.12

NR Band n41 (SRS1)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n41	100	2546.0	19.30	85.11
		2593.0	20.02	100.46
		2640.0	19.54	89.95
	90	2541.0		
		2593.0		
		2645.0		
	80	2536.0		
		2594.0		
		2650.0		
	60	2526.0		
		2593.0		
		2660.0		
	50	2521.0		
		2593.0		
		2665.0		
	40	2516.0		
		2593.0		
		2670.0		
	30	2511.0		
		2593.0		
		2675.0		
	20	2506.0		
		2593.0		
		2680.0		
	15	2503.5		
		2593.0		
		2682.5		
	10	2501.0		
		2593.0		
		2685.0		

NR Band n41 (SRS2)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n41	100	2546.0	14.66	29.24
		2593.0	14.93	31.12
		2640.0	14.71	29.58
	90	2541.0		
		2593.0		
		2645.0		
	80	2536.0		
		2594.0		
		2650.0		
	60	2526.0		
		2593.0		
		2660.0		
	50	2521.0		
		2593.0		
		2665.0		
	40	2516.0		
		2593.0		
		2670.0		
	30	2511.0		
		2593.0		
		2675.0		
	20	2506.0		
		2593.0		
		2680.0		
	15	2503.5		
		2593.0		
		2682.5		
	10	2501.0		
		2593.0		
		2685.0		

NR Band n41 (SRS3)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n41	100	2546.0	15.81	38.11
		2593.0	15.63	36.56
		2640.0	14.75	29.85
	90	2541.0		
		2593.0		
		2645.0		
	80	2536.0		
		2594.0		
		2650.0		
	60	2526.0		
		2593.0		
		2660.0		
	50	2521.0		
		2593.0		
		2665.0		
	40	2516.0		
		2593.0		
		2670.0		
	30	2511.0		
		2593.0		
		2675.0		
	20	2506.0		
		2593.0		
		2680.0		
	15	2503.5		
		2593.0		
		2682.5		
	10	2501.0		
		2593.0		
		2685.0		

NR Band n77(3450 ~ 3550 MHz)

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n77	100	DFT-s OFDM	QPSK	1/137	3500.0	24.06	254.68
			16QAM	1/271	3500.0	23.14	206.06
	90	DFT-s OFDM	QPSK	1/123	3495.0	24.20	263.03
				1/243	3500.0	23.10	204.17
				1/123	3505.0	23.53	225.42
			16QAM	1/243	3495.0	23.29	213.30
				1/243	3500.0	22.72	187.07
				1/243	3505.0	22.55	179.89
	80	DFT-s OFDM	QPSK	1/109	3490.0	24.13	258.82
				1/215	3500.0	23.38	217.77
				1/109	3510.0	22.97	198.15
			16QAM	1/215	3490.0	23.04	201.37
				1/215	3500.0	22.68	185.35
				1/215	3510.0	22.50	177.83
	70	DFT-s OFDM	QPSK	1/95	3485.0	24.30	269.15
				1/187	3500.0	22.34	171.40
				1/95	3515.0	23.67	232.81
			16QAM	1/187	3485.0	23.22	209.89
				1/187	3500.0	21.77	150.31
				1/187	3515.0	22.97	198.15
	60	DFT-s OFDM	QPSK	1/81	3480.0	23.05	201.84
				1/160	3500.0	22.58	181.13
				1/81	3520.0	22.13	163.31
			16QAM	1/160	3480.0	22.10	162.18
				1/160	3500.0	21.98	157.76
				1/160	3520.0	20.39	109.40
	50	DFT-s OFDM	QPSK	1/131	3475.0	23.01	199.99
				1/67	3500.0	22.64	183.65
				1/131	3525.0	22.16	164.44
			16QAM	1/67	3475.0	22.75	188.36
				1/67	3500.0	22.44	175.39
				1/67	3525.0	22.52	178.65
	40	DFT-s OFDM	QPSK	1/104	3470.0	23.16	207.01
				1/53	3500.0	23.21	209.41
				1/53	3530.0	22.74	187.93
			16QAM	1/53	3470.0	22.34	171.40
				1/53	3500.0	22.45	175.79
				1/53	3530.0	21.80	151.36

Band	BW [MHz]	Modulation	Mode	RB Size/	f [MHz]	ERP / EIRP	
				RB Offset		[dBm]	[mW]
n77	30	DFT-s OFDM	QPSK	1/76	3465.0	22.29	169.43
				1/76	3500.0	22.72	187.07
				1/39	3535.0	23.14	206.06
			16QAM	1/76	3465.0	21.84	152.76
				1/76	3500.0	21.99	158.12
				1/76	3535.0	22.55	179.89
	20	DFT-s OFDM	QPSK	1/49	3460.0	23.02	200.45
				1/1	3500.0	23.25	211.35
				1/1	3540.0	23.40	218.78
			16QAM	1/1	3460.0	22.83	191.87
				1/1	3500.0	22.86	193.20
				1/1	3540.0	22.84	192.31
	15	DFT-s OFDM	QPSK	1/36	3457.5	22.76	188.80
				1/36	3500.0	23.54	225.94
				1/1	3542.5	22.55	179.89
			16QAM	1/1	3457.5	22.36	172.19
				1/1	3500.0	21.99	158.12
				1/1	3542.5	22.12	162.93
	10	DFT-s OFDM	QPSK	1/1	3455.0	23.03	200.91
				1/1	3500.0	22.87	193.64
				1/1	3545.0	22.62	182.81
			16QAM	1/1	3455.0	22.75	188.36
				1/1	3500.0	22.48	177.01
				1/1	3545.0	22.19	165.58

NR Band n77(3450 ~ 3550 MHz, SRS1)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n77	100	3500.0	14.17	26.12
	90	3495.0		
		3500.0		
		3505.0		
	80	3490.0		
		3500.0		
		3510.0		
	70	3485.0		
		3500.0		
		3515.0		
	60	3480.0		
		3500.0		
		3520.0		
	50	3475.0		
		3500.0		
		3525.0		
	40	3470.0		
		3500.0		
		3530.0		
	30	3465.0		
		3500.0		
		3535.0		
	20	3460.0		
		3500.0		
		3540.0		
	15	3457.5		
		3500.0		
		3542.5		
	10	3455.0		
		3500.0		
		3545.0		

NR Band n77(3450 ~ 3550 MHz, SRS2)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n77	100	3500.0	19.21	83.37
	90	3495.0		
		3500.0		
		3505.0		
	80	3490.0		
		3500.0		
		3510.0		
	70	3485.0		
		3500.0		
		3515.0		
	60	3480.0		
		3500.0		
		3520.0		
	50	3475.0		
		3500.0		
		3525.0		
	40	3470.0		
		3500.0		
		3530.0		
	30	3465.0		
		3500.0		
		3535.0		
	20	3460.0		
		3500.0		
		3540.0		
	15	3457.5		
		3500.0		
		3542.5		
	10	3455.0		
		3500.0		
		3545.0		

NR Band n77(3450 ~ 3550 MHz, SRS3)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n77	100	3500.0	14.46	27.93
	90	3495.0		
		3500.0		
		3505.0		
	80	3490.0		
		3500.0		
		3510.0		
	70	3485.0		
		3500.0		
		3515.0		
	60	3480.0		
		3500.0		
		3520.0		
	50	3475.0		
		3500.0		
		3525.0		
	40	3470.0		
		3500.0		
		3530.0		
	30	3465.0		
		3500.0		
		3535.0		
	20	3460.0		
		3500.0		
		3540.0		
	15	3457.5		
		3500.0		
		3542.5		
	10	3455.0		
		3500.0		
		3545.0		

NR Band n77(3700 ~ 3980 MHz)

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n77	100	DFT-s OFDM	QPSK	1/1	3750.0	25.42	348.34
				1/271	3840.0	23.13	205.59
				1/1	3930.0	23.50	223.87
			16QAM	1/1	3750.0	24.32	270.40
				1/271	3840.0	22.72	187.07
				1/1	3930.0	23.20	208.93
	90	DFT-s OFDM	QPSK	1/243	3745.0	24.60	288.40
				1/243	3840.0	22.77	189.23
				1/243	3935.0	23.49	223.36
			16QAM	1/243	3745.0	23.51	224.39
				1/243	3840.0	22.22	166.72
				1/243	3935.0	23.06	202.30
	80	DFT-s OFDM	QPSK	1/215	3740.0	23.09	203.70
				1/109	3840.0	23.14	206.06
				1/215	3940.0	22.25	167.88
			16QAM	1/215	3740.0	22.29	169.43
				1/109	3840.0	22.98	198.61
				1/215	3940.0	21.79	151.01
	70	DFT-s OFDM	QPSK	1/187	3735.0	24.15	260.02
				1/95	3840.0	23.83	241.55
				1/95	3945.0	23.04	201.37
			16QAM	1/187	3735.0	23.20	208.93
				1/95	3840.0	23.06	202.30
				1/95	3945.0	22.53	179.06
	60	DFT-s OFDM	QPSK	1/160	3730.0	24.01	251.77
				1/81	3840.0	23.67	232.81
				1/81	3950.0	23.27	212.32
			16QAM	1/160	3730.0	23.12	205.12
				1/81	3840.0	22.70	186.21
				1/81	3950.0	22.43	174.98
	50	DFT-s OFDM	QPSK	1/131	3725.0	23.71	234.96
				1/1	3840.0	23.90	245.47
				1/1	3955.0	23.26	211.84
			16QAM	1/131	3725.0	23.26	211.84
				1/1	3840.0	22.46	176.20
				1/1	3955.0	23.03	200.91

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
						[dBm]	[mW]
n77	40	DFT-s OFDM	QPSK	1/104	3720.0	24.12	258.23
				1/53	3840.0	23.40	218.78
				1/1	3960.0	23.50	223.87
			16QAM	1/104	3720.0	23.22	209.89
				1/53	3840.0	22.62	182.81
				1/1	3960.0	22.42	174.58
	30	DFT-s OFDM	QPSK	1/76	3715.0	24.28	267.92
				1/39	3840.0	23.43	220.29
				1/1	3965.0	23.18	207.97
			16QAM	1/76	3715.0	23.42	219.79
				1/39	3840.0	22.26	168.27
				1/1	3965.0	22.13	163.31
	20	DFT-s OFDM	QPSK	1/49	3710.0	24.08	255.86
				1/26	3840.0	23.79	239.33
				1/1	3670.0	23.23	210.38
			16QAM	1/49	3710.0	22.71	186.64
				1/26	3840.0	22.49	177.42
				1/1	3670.0	22.00	158.49
	15	DFT-s OFDM	QPSK	1/36	3707.5	24.13	258.82
				1/19	3840.0	23.62	230.14
				1/1	3972.5	22.25	167.88
			16QAM	1/36	3707.5	23.34	215.77
				1/19	3840.0	22.31	170.22
				1/1	3972.5	21.85	153.11
	10	DFT-s OFDM	QPSK	1/12	3705.0	24.21	263.63
				1/12	3840.0	23.47	222.33
				1/1	3975.0	23.15	206.54
			16QAM	1/12	3705.0	23.09	203.70
				1/12	3840.0	22.22	166.72
				1/1	3975.0	21.98	157.76

NR Band n77(3700 ~ 3980 MHz, SRS1)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n77	100	3750.0		
		3840.0		
		3930.0		
	90	3745.0	13.11	20.46
		3840.0	12.82	19.14
		3935.0	12.39	17.34
	80	3740.0		
		3840.0		
		3940.0		
	70	3735.0		
		3840.0		
		3945.0		
	60	3730.0		
		3840.0		
		3950.0		
	50	3725.0		
		3840.0		
		3955.0		
	40	3720.0		
		3840.0		
		3960.0		
	30	3715.0		
		3840.0		
		3965.0		
	20	3710.0		
		3840.0		
		3670.0		
	15	3707.5		
		3840.0		
		3972.5		
	10	3705.0		
		3840.0		
		3975.0		

NR Band n77(3700 ~ 3980 MHz, SRS2)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n77	100	3750.0	15.46	35.16
		3840.0	15.09	32.28
		3930.0	13.34	21.58
	90	3745.0		
		3840.0		
		3935.0		
	80	3740.0		
		3840.0		
		3940.0		
	70	3735.0		
		3840.0		
		3945.0		
	60	3730.0		
		3840.0		
		3950.0		
	50	3725.0		
		3840.0		
		3955.0		
	40	3720.0		
		3840.0		
		3960.0		
	30	3715.0		
		3840.0		
		3965.0		
	20	3710.0		
		3840.0		
		3670.0		
	15	3707.5		
		3840.0		
		3972.5		
	10	3705.0		
		3840.0		
		3975.0		

NR Band n77(3700 ~ 3980 MHz, SRS3)

Band	BW	f [MHz]	ERP / EIRP	
	[MHz]		[dBm]	[mW]
n77	100	3750.0		
		3840.0		
		3930.0		
	90	3745.0		
		3840.0		
		3935.0		
	80	3740.0		
		3840.0		
		3940.0		
	70	3735.0	14.10	25.70
		3840.0	13.96	24.89
		3945.0	11.03	12.68
	60	3730.0		
		3840.0		
		3950.0		
	50	3725.0		
		3840.0		
		3955.0		
	40	3720.0		
		3840.0		
		3960.0		
	30	3715.0		
		3840.0		
		3965.0		
	20	3710.0		
		3840.0		
		3670.0		
	15	3707.5		
		3840.0		
		3972.5		
	10	3705.0		
		3840.0		
		3975.0		

15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 1/28/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: 5G NR_QPSK NR n25 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1857.50</td><td>12.02</td><td>V</td><td>4.5</td><td>9.5</td><td>17.09</td><td>33.0</td><td>-15.9</td><td></td></tr><tr><td>1857.50</td><td>17.55</td><td>H</td><td>4.5</td><td>9.5</td><td>22.62</td><td>33.0</td><td>-10.4</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1882.50</td><td>12.91</td><td>V</td><td>4.5</td><td>9.4</td><td>17.77</td><td>33.0</td><td>-15.2</td><td></td></tr><tr><td>1882.50</td><td>17.96</td><td>H</td><td>4.5</td><td>9.4</td><td>22.82</td><td>33.0</td><td>-10.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.50</td><td>14.09</td><td>V</td><td>4.5</td><td>9.2</td><td>18.71</td><td>33.0</td><td>-14.3</td><td></td></tr><tr><td>1907.50</td><td>18.03</td><td>H</td><td>4.5</td><td>9.2</td><td>22.65</td><td>33.0</td><td>-10.3</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1857.50	12.02	V	4.5	9.5	17.09	33.0	-15.9		1857.50	17.55	H	4.5	9.5	22.62	33.0	-10.4		Mid Ch									1882.50	12.91	V	4.5	9.4	17.77	33.0	-15.2		1882.50	17.96	H	4.5	9.4	22.82	33.0	-10.2		High Ch									1907.50	14.09	V	4.5	9.2	18.71	33.0	-14.3		1907.50	18.03	H	4.5	9.2	22.65	33.0	-10.3	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	1907.50	13.04	V	4.5	9.2	17.66	33.0	-15.3																																																																																											
1907.50	17.04	H	4.5	9.2	21.65	33.0	-11.3																																																																																												

10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 1/28/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: 5G NR_QPSK NR n25 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1855.00</td><td>12.03</td><td>V</td><td>4.5</td><td>9.6</td><td>17.11</td><td>33.0</td><td>-15.9</td><td></td></tr><tr><td>1855.00</td><td>17.44</td><td>H</td><td>4.5</td><td>9.6</td><td>22.53</td><td>33.0</td><td>-10.5</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1882.50</td><td>12.84</td><td>V</td><td>4.5</td><td>9.4</td><td>17.70</td><td>33.0</td><td>-15.3</td><td></td></tr><tr><td>1882.50</td><td>18.09</td><td>H</td><td>4.5</td><td>9.4</td><td>22.95</td><td>33.0</td><td>-10.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1910.00</td><td>14.25</td><td>V</td><td>4.5</td><td>9.1</td><td>18.84</td><td>33.0</td><td>-14.2</td><td></td></tr><tr><td>1910.00</td><td>18.20</td><td>H</td><td>4.5</td><td>9.1</td><td>22.79</td><td>33.0</td><td>-10.2</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1855.00	12.03	V	4.5	9.6	17.11	33.0	-15.9		1855.00	17.44	H	4.5	9.6	22.53	33.0	-10.5		Mid Ch									1882.50	12.84	V	4.5	9.4	17.70	33.0	-15.3		1882.50	18.09	H	4.5	9.4	22.95	33.0	-10.1		High Ch									1910.00	14.25	V	4.5	9.1	18.84	33.0	-14.2		1910.00	18.20	H	4.5	9.1	22.79	33.0	-10.2	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	1855.00	12.03	V	4.5	9.6	17.11	33.0	-15.9																																																																																											
	1855.00	17.44	H	4.5	9.6	22.53	33.0	-10.5																																																																																											
	Mid Ch																																																																																																		
	1882.50	12.84	V	4.5	9.4	17.70	33.0	-15.3																																																																																											
	1882.50	18.09	H	4.5	9.4	22.95	33.0	-10.1																																																																																											
	High Ch																																																																																																		
	1910.00	14.25	V	4.5	9.1	18.84	33.0	-14.2																																																																																											
1910.00	18.20	H	4.5	9.1	22.79	33.0	-10.2																																																																																												
10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 1/28/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: 5G NR_16QAM NR n25 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1855.00</td><td>11.19</td><td>V</td><td>4.5</td><td>9.6</td><td>16.28</td><td>33.0</td><td>-16.7</td><td></td></tr><tr><td>1855.00</td><td>16.22</td><td>H</td><td>4.5</td><td>9.6</td><td>21.31</td><td>33.0</td><td>-11.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1882.50</td><td>12.00</td><td>V</td><td>4.5</td><td>9.4</td><td>16.86</td><td>33.0</td><td>-16.1</td><td></td></tr><tr><td>1882.50</td><td>17.19</td><td>H</td><td>4.5</td><td>9.4</td><td>22.05</td><td>33.0</td><td>-10.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1910.00</td><td>13.18</td><td>V</td><td>4.5</td><td>9.1</td><td>17.76</td><td>33.0</td><td>-15.2</td><td></td></tr><tr><td>1910.00</td><td>16.97</td><td>H</td><td>4.5</td><td>9.1</td><td>21.55</td><td>33.0</td><td>-11.4</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1855.00	11.19	V	4.5	9.6	16.28	33.0	-16.7		1855.00	16.22	H	4.5	9.6	21.31	33.0	-11.7		Mid Ch									1882.50	12.00	V	4.5	9.4	16.86	33.0	-16.1		1882.50	17.19	H	4.5	9.4	22.05	33.0	-10.9		High Ch									1910.00	13.18	V	4.5	9.1	17.76	33.0	-15.2		1910.00	16.97	H	4.5	9.1	21.55	33.0	-11.4	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	1855.00	11.19	V	4.5	9.6	16.28	33.0	-16.7																																																																																											
	1855.00	16.22	H	4.5	9.6	21.31	33.0	-11.7																																																																																											
	Mid Ch																																																																																																		
	1882.50	12.00	V	4.5	9.4	16.86	33.0	-16.1																																																																																											
	1882.50	17.19	H	4.5	9.4	22.05	33.0	-10.9																																																																																											
	High Ch																																																																																																		
	1910.00	13.18	V	4.5	9.1	17.76	33.0	-15.2																																																																																											
1910.00	16.97	H	4.5	9.1	21.55	33.0	-11.4																																																																																												

5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 1/28/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: 5G NR_QPSK NR n2 Fundamentals, 5MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.50</td><td>12.13</td><td>V</td><td>4.5</td><td>9.6</td><td>17.24</td><td>33.0</td><td>-15.8</td><td></td></tr><tr><td>1852.50</td><td>17.42</td><td>H</td><td>4.5</td><td>9.6</td><td>22.53</td><td>33.0</td><td>-10.5</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1882.50</td><td>13.06</td><td>V</td><td>4.5</td><td>9.4</td><td>17.92</td><td>33.0</td><td>-15.1</td><td></td></tr><tr><td>1882.50</td><td>18.30</td><td>H</td><td>4.5</td><td>9.4</td><td>23.16</td><td>33.0</td><td>-9.8</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1912.50</td><td>13.81</td><td>V</td><td>4.5</td><td>9.1</td><td>18.36</td><td>33.0</td><td>-14.6</td><td></td></tr><tr><td>1912.50</td><td>18.33</td><td>H</td><td>4.5</td><td>9.1</td><td>22.88</td><td>33.0</td><td>-10.1</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1852.50	12.13	V	4.5	9.6	17.24	33.0	-15.8		1852.50	17.42	H	4.5	9.6	22.53	33.0	-10.5		Mid Ch									1882.50	13.06	V	4.5	9.4	17.92	33.0	-15.1		1882.50	18.30	H	4.5	9.4	23.16	33.0	-9.8		High Ch									1912.50	13.81	V	4.5	9.1	18.36	33.0	-14.6		1912.50	18.33	H	4.5	9.1	22.88	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																																																																																										
	Low Ch																																																																																																		
	1852.50	12.13	V	4.5	9.6	17.24	33.0	-15.8																																																																																											
	1852.50	17.42	H	4.5	9.6	22.53	33.0	-10.5																																																																																											
	Mid Ch																																																																																																		
	1882.50	13.06	V	4.5	9.4	17.92	33.0	-15.1																																																																																											
	1882.50	18.30	H	4.5	9.4	23.16	33.0	-9.8																																																																																											
	High Ch																																																																																																		
	1912.50	13.81	V	4.5	9.1	18.36	33.0	-14.6																																																																																											
1912.50	18.33	H	4.5	9.1	22.88	33.0	-10.1																																																																																												
5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 1/28/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 1 Mode: 5G NR_16QAM NR n2 Fundamentals, 5MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.50</td><td>11.13</td><td>V</td><td>4.5</td><td>9.6</td><td>16.24</td><td>33.0</td><td>-16.8</td><td></td></tr><tr><td>1852.50</td><td>16.40</td><td>H</td><td>4.5</td><td>9.6</td><td>21.52</td><td>33.0</td><td>-11.5</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1882.50</td><td>11.94</td><td>V</td><td>4.5</td><td>9.4</td><td>16.80</td><td>33.0</td><td>-16.2</td><td></td></tr><tr><td>1882.50</td><td>17.09</td><td>H</td><td>4.5</td><td>9.4</td><td>21.94</td><td>33.0</td><td>-11.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1912.50</td><td>12.93</td><td>V</td><td>4.5</td><td>9.1</td><td>17.48</td><td>33.0</td><td>-15.5</td><td></td></tr><tr><td>1912.50</td><td>17.38</td><td>H</td><td>4.5</td><td>9.1</td><td>21.93</td><td>33.0</td><td>-11.1</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1852.50	11.13	V	4.5	9.6	16.24	33.0	-16.8		1852.50	16.40	H	4.5	9.6	21.52	33.0	-11.5		Mid Ch									1882.50	11.94	V	4.5	9.4	16.80	33.0	-16.2		1882.50	17.09	H	4.5	9.4	21.94	33.0	-11.1		High Ch									1912.50	12.93	V	4.5	9.1	17.48	33.0	-15.5		1912.50	17.38	H	4.5	9.1	21.93	33.0	-11.1	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	1852.50	11.13	V	4.5	9.6	16.24	33.0	-16.8																																																																																											
	1852.50	16.40	H	4.5	9.6	21.52	33.0	-11.5																																																																																											
	Mid Ch																																																																																																		
	1882.50	11.94	V	4.5	9.4	16.80	33.0	-16.2																																																																																											
	1882.50	17.09	H	4.5	9.4	21.94	33.0	-11.1																																																																																											
	High Ch																																																																																																		
	1912.50	12.93	V	4.5	9.1	17.48	33.0	-15.5																																																																																											
1912.50	17.38	H	4.5	9.1	21.93	33.0	-11.1																																																																																												

NR Band n41

100MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/17/2022

19568

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2546.01	13.07	V	5.3	10.1	17.91	33.0	-15.1	
2546.01	16.60	H	5.3	10.1	21.43	33.0	-11.6	
Mid Ch								
2592.99	13.35	V	5.3	10.1	18.13	33.0	-14.9	
2592.99	17.59	H	5.3	10.1	22.37	33.0	-10.6	
High Ch								
2640.00	13.81	V	5.4	10.1	18.56	33.0	-14.4	
2640.00	16.45	H	5.4	10.1	21.20	33.0	-11.8	

100MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/17/2022

19568

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2546.01	12.40	V	5.3	10.1	17.24	33.0	-15.8	
2546.01	15.50	H	5.3	10.1	20.33	33.0	-12.7	
Mid Ch								
2592.99	13.09	V	5.3	10.1	17.87	33.0	-15.1	
2592.99	17.37	H	5.3	10.1	22.15	33.0	-10.8	
High Ch								
2640.00	13.56	V	5.4	10.1	18.31	33.0	-14.7	
2640.00	15.61	H	5.4	10.1	20.36	33.0	-12.6	

90MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19227

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 90MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2541.01	16.28	V	5.3	10.1	21.13	33.0	-11.9	
2541.01	19.64	H	5.3	10.1	24.48	33.0	-8.5	
Mid Ch								
2592.99	15.30	V	5.3	10.1	20.08	33.0	-12.9	
2592.99	19.32	H	5.3	10.1	24.10	33.0	-8.9	
High Ch								
2645.00	14.87	V	5.4	10.1	19.60	33.0	-13.4	
2645.00	18.28	H	5.4	10.1	23.01	33.0	-10.0	

90MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19227

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 90MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2541.01	15.24	V	5.3	10.1	20.09	33.0	-12.9	
2541.01	18.56	H	5.3	10.1	23.40	33.0	-9.6	
Mid Ch								
2592.99	14.26	V	5.3	10.1	19.04	33.0	-14.0	
2592.99	18.02	H	5.3	10.1	22.80	33.0	-10.2	
High Ch								
2645.00	14.38	V	5.4	10.1	19.11	33.0	-13.9	
2645.00	17.66	H	5.4	10.1	22.39	33.0	-10.6	

80MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19227

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 80MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2536.01	13.78	V	5.3	10.1	18.64	33.0	-14.4	
2536.01	18.39	H	5.3	10.1	23.25	33.0	-9.7	
Mid Ch								
2592.99	14.31	V	5.3	10.1	19.09	33.0	-13.9	
2592.99	18.69	H	5.3	10.1	23.47	33.0	-9.5	
High Ch								
2650.00	15.62	V	5.4	10.1	20.36	33.0	-12.6	
2650.00	18.73	H	5.4	10.1	23.46	33.0	-9.5	

80MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19227

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 80MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2536.01	12.46	V	5.3	10.1	17.32	33.0	-15.7	
2536.01	17.26	H	5.3	10.1	22.12	33.0	-10.9	
Mid Ch								
2592.99	13.40	V	5.3	10.1	18.18	33.0	-14.8	
2592.99	18.30	H	5.3	10.1	23.08	33.0	-9.9	
High Ch								
2650.00	14.32	V	5.4	10.1	19.06	33.0	-13.9	
2650.00	18.11	H	5.4	10.1	22.84	33.0	-10.2	

60MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/8/2022

19568

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 60MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2526.01	15.40	V	5.3	10.2	20.30	33.0	-12.7	
2526.01	18.92	H	5.3	10.2	23.81	33.0	-9.2	
Mid Ch								
2592.99	14.78	V	5.3	10.1	19.56	33.0	-13.4	
2592.99	19.09	H	5.3	10.1	23.87	33.0	-9.1	
High Ch								
2660.00	14.76	V	5.4	10.1	19.50	33.0	-13.5	
2660.00	17.11	H	5.4	10.1	21.85	33.0	-11.1	

60MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/8/2022

19568

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 60MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2526.01	15.19	V	5.3	10.2	20.09	33.0	-12.9	
2526.01	18.75	H	5.3	10.2	23.64	33.0	-9.4	
Mid Ch								
2592.99	13.88	V	5.3	10.1	18.66	33.0	-14.3	
2592.99	18.22	H	5.3	10.1	23.00	33.0	-10.0	
High Ch								
2660.00	14.30	V	5.4	10.1	19.04	33.0	-14.0	
2660.00	16.62	H	5.4	10.1	21.36	33.0	-11.6	

50MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/8/2022

19568

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 50MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2521.01	15.56	V	5.3	10.2	20.47	33.0	-12.5	
2521.01	19.54	H	5.3	10.2	24.45	33.0	-8.6	
Mid Ch								
2592.99	15.66	V	5.3	10.1	20.44	33.0	-12.6	
2592.99	19.82	H	5.3	10.1	24.60	33.0	-8.4	
High Ch								
2665.00	14.51	V	5.4	10.2	19.26	33.0	-13.7	
2665.00	19.52	H	5.4	10.2	24.26	33.0	-8.7	

50MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/8/2022

19568

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 50MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2521.01	12.86	V	5.3	10.2	17.77	33.0	-15.2	
2521.01	18.14	H	5.3	10.2	23.05	33.0	-10.0	
Mid Ch								
2592.99	15.56	V	5.3	10.1	20.34	33.0	-12.7	
2592.99	19.52	H	5.3	10.1	24.30	33.0	-8.7	
High Ch								
2665.00	13.70	V	5.4	10.2	18.45	33.0	-14.6	
2665.00	18.79	H	5.4	10.2	23.53	33.0	-9.5	

40MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19227

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 40MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2516.01	15.45	V	5.3	10.2	20.37	33.0	-12.6	
2516.01	18.90	H	5.3	10.2	23.83	33.0	-9.2	
Mid Ch								
2592.99	13.90	V	5.3	10.1	18.68	33.0	-14.3	
2592.99	16.75	H	5.3	10.1	21.53	33.0	-11.5	
High Ch								
2670.00	16.70	V	5.4	10.2	21.44	33.0	-11.6	
2670.00	19.14	H	5.4	10.2	23.88	33.0	-9.1	

40MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19227

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 40MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2516.01	14.11	V	5.3	10.2	19.03	33.0	-14.0	
2516.01	17.72	H	5.3	10.2	22.65	33.0	-10.4	
Mid Ch								
2592.99	13.08	V	5.3	10.1	17.86	33.0	-15.1	
2592.99	16.12	H	5.3	10.1	20.90	33.0	-12.1	
High Ch								
2670.00	15.40	V	5.4	10.2	20.14	33.0	-12.9	
2670.00	17.09	H	5.4	10.2	21.83	33.0	-11.2	

30MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/8/2022

19568

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 30MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2511.01	13.48	V	5.3	10.2	18.41	33.0	-14.6	
2511.01	19.16	H	5.3	10.2	24.10	33.0	-8.9	
Mid Ch								
2592.99	14.89	V	5.3	10.1	19.67	33.0	-13.3	
2592.99	19.53	H	5.3	10.1	24.31	33.0	-8.7	
High Ch								
2675.00	14.74	V	5.4	10.2	19.50	33.0	-13.5	
2675.00	18.53	H	5.4	10.2	23.28	33.0	-9.7	

30MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/8/2022

19568

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 30MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2511.01	13.27	V	5.3	10.2	18.20	33.0	-14.8	
2511.01	18.65	H	5.3	10.2	23.59	33.0	-9.4	
Mid Ch								
2592.99	14.08	V	5.3	10.1	18.86	33.0	-14.1	
2592.99	19.10	H	5.3	10.1	23.88	33.0	-9.1	
High Ch								
2675.00	13.87	V	5.4	10.2	18.63	33.0	-14.4	
2675.00	17.41	H	5.4	10.2	22.16	33.0	-10.8	

20MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4790270388

Date: 2/8/2022

Test Engineer: 19568

Configuration: EUT, X-Position

Location: Chamber 2

Mode: 5G NR_QPSK NR n41 Fundamentals, 20MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2506.01	15.54	V	5.2	10.2	20.49	33.0	-12.5	
2506.01	18.75	H	5.2	10.2	23.71	33.0	-9.3	
Mid Ch								
2592.99	14.69	V	5.3	10.1	19.47	33.0	-13.5	
2592.99	19.40	H	5.3	10.1	24.18	33.0	-8.8	
High Ch								
2680.00	15.84	V	5.4	10.2	20.60	33.0	-12.4	
2680.00	18.36	H	5.4	10.2	23.12	33.0	-9.9	

20MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4790270388

Date: 2/8/2022

Test Engineer: 19568

Configuration: EUT, X-Position

Location: Chamber 2

Mode: 5G NR_16QAM NR n41 Fundamentals, 20MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2506.01	15.31	V	5.2	10.2	20.26	33.0	-12.7	
2506.01	18.48	H	5.2	10.2	23.44	33.0	-9.6	
Mid Ch								
2592.99	13.72	V	5.3	10.1	18.50	33.0	-14.5	
2592.99	18.48	H	5.3	10.1	23.26	33.0	-9.7	
High Ch								
2680.00	15.39	V	5.4	10.2	20.15	33.0	-12.8	
2680.00	18.03	H	5.4	10.2	22.79	33.0	-10.2	

15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/9/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n41 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2503.51</td><td>14.44</td><td>V</td><td>5.2</td><td>10.2</td><td>19.40</td><td>33.0</td><td>-13.6</td><td></td></tr><tr><td>2503.51</td><td>19.46</td><td>H</td><td>5.2</td><td>10.2</td><td>24.42</td><td>33.0</td><td>-8.6</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2592.99</td><td>14.48</td><td>V</td><td>5.3</td><td>10.1</td><td>19.26</td><td>33.0</td><td>-13.7</td><td></td></tr><tr><td>2592.99</td><td>19.20</td><td>H</td><td>5.3</td><td>10.1</td><td>23.98</td><td>33.0</td><td>-9.0</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2682.50</td><td>15.59</td><td>V</td><td>5.4</td><td>10.2</td><td>20.35</td><td>33.0</td><td>-12.7</td><td></td></tr><tr><td>2682.50</td><td>18.57</td><td>H</td><td>5.4</td><td>10.2</td><td>23.33</td><td>33.0</td><td>-9.7</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									2503.51	14.44	V	5.2	10.2	19.40	33.0	-13.6		2503.51	19.46	H	5.2	10.2	24.42	33.0	-8.6		Mid Ch									2592.99	14.48	V	5.3	10.1	19.26	33.0	-13.7		2592.99	19.20	H	5.3	10.1	23.98	33.0	-9.0		High Ch									2682.50	15.59	V	5.4	10.2	20.35	33.0	-12.7		2682.50	18.57	H	5.4	10.2	23.33	33.0	-9.7	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	2503.51	14.44	V	5.2	10.2	19.40	33.0	-13.6																																																																																											
	2503.51	19.46	H	5.2	10.2	24.42	33.0	-8.6																																																																																											
	Mid Ch																																																																																																		
	2592.99	14.48	V	5.3	10.1	19.26	33.0	-13.7																																																																																											
	2592.99	19.20	H	5.3	10.1	23.98	33.0	-9.0																																																																																											
	High Ch																																																																																																		
	2682.50	15.59	V	5.4	10.2	20.35	33.0	-12.7																																																																																											
2682.50	18.57	H	5.4	10.2	23.33	33.0	-9.7																																																																																												
15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/9/2022 Test Engineer: 19227 Configuration: EUT, X-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n41 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2503.51</td><td>13.36</td><td>V</td><td>5.2</td><td>10.2</td><td>18.32</td><td>33.0</td><td>-14.7</td><td></td></tr><tr><td>2503.51</td><td>18.59</td><td>H</td><td>5.2</td><td>10.2</td><td>23.55</td><td>33.0</td><td>-9.5</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2592.99</td><td>13.08</td><td>V</td><td>5.3</td><td>10.1</td><td>17.86</td><td>33.0</td><td>-15.1</td><td></td></tr><tr><td>2592.99</td><td>17.98</td><td>H</td><td>5.3</td><td>10.1</td><td>22.76</td><td>33.0</td><td>-10.2</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2682.50</td><td>14.72</td><td>V</td><td>5.4</td><td>10.2</td><td>19.48</td><td>33.0</td><td>-13.5</td><td></td></tr><tr><td>2682.50</td><td>17.73</td><td>H</td><td>5.4</td><td>10.2</td><td>22.49</td><td>33.0</td><td>-10.5</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									2503.51	13.36	V	5.2	10.2	18.32	33.0	-14.7		2503.51	18.59	H	5.2	10.2	23.55	33.0	-9.5		Mid Ch									2592.99	13.08	V	5.3	10.1	17.86	33.0	-15.1		2592.99	17.98	H	5.3	10.1	22.76	33.0	-10.2		High Ch									2682.50	14.72	V	5.4	10.2	19.48	33.0	-13.5		2682.50	17.73	H	5.4	10.2	22.49	33.0	-10.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	2503.51	13.36	V	5.2	10.2	18.32	33.0	-14.7																																																																																											
	2503.51	18.59	H	5.2	10.2	23.55	33.0	-9.5																																																																																											
	Mid Ch																																																																																																		
	2592.99	13.08	V	5.3	10.1	17.86	33.0	-15.1																																																																																											
	2592.99	17.98	H	5.3	10.1	22.76	33.0	-10.2																																																																																											
	High Ch																																																																																																		
	2682.50	14.72	V	5.4	10.2	19.48	33.0	-13.5																																																																																											
2682.50	17.73	H	5.4	10.2	22.49	33.0	-10.5																																																																																												

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19568

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2501.01	13.25	V	5.2	10.2	18.22	33.0	-14.8	
2501.01	19.05	H	5.2	10.2	24.02	33.0	-9.0	
Mid Ch								
2592.99	14.76	V	5.3	10.1	19.54	33.0	-13.5	
2592.99	18.93	H	5.3	10.1	23.71	33.0	-9.3	
High Ch								
2685.00	14.75	V	5.4	10.2	19.51	33.0	-13.5	
2685.00	17.54	H	5.4	10.2	22.30	33.0	-10.7	

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/9/2022

19568

EUT, X-Position

Chamber 2

5G NR_16QAM NR n41 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2501.01	12.16	V	5.2	10.2	17.13	33.0	-15.9	
2501.01	17.54	H	5.2	10.2	22.51	33.0	-10.5	
Mid Ch								
2592.99	13.26	V	5.3	10.1	18.04	33.0	-15.0	
2592.99	18.07	H	5.3	10.1	22.85	33.0	-10.1	
High Ch								
2685.00	13.49	V	5.4	10.2	18.25	33.0	-14.7	
2685.00	16.35	H	5.4	10.2	21.11	33.0	-11.9	

NR Band n41 (SRS1)

100MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/18/2022

19227

EUT, X-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2546.01	10.42	V	5.3	10.1	15.26	33.0	-17.7	
2546.01	14.47	H	5.3	10.1	19.30	33.0	-13.7	
Mid Ch								
2592.99	9.80	V	5.3	10.1	14.58	33.0	-18.4	
2592.99	15.24	H	5.3	10.1	20.02	33.0	-13.0	
High Ch								
2640.00	10.39	V	5.4	10.1	15.14	33.0	-17.9	
2640.00	14.79	H	5.4	10.1	19.54	33.0	-13.5	

NR Band n41 (SRS2)

100MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/18/2022

19227

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2546.01	3.62	V	5.3	10.1	8.46	33.0	-24.5	
2546.01	9.83	H	5.3	10.1	14.66	33.0	-18.3	
Mid Ch								
2592.99	2.02	V	5.3	10.1	6.80	33.0	-26.2	
2592.99	10.15	H	5.3	10.1	14.93	33.0	-18.1	
High Ch								
2640.00	0.63	V	5.4	10.1	5.38	33.0	-27.6	
2640.00	9.96	H	5.4	10.1	14.71	33.0	-18.3	

NR Band n41 (SRS3)

100MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/18/2022

19227

EUT, Z-Position

Chamber 2

5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
2546.01	6.53	V	5.3	10.1	11.37	33.0	-21.6	
2546.01	10.98	H	5.3	10.1	15.81	33.0	-17.2	
Mid Ch								
2592.99	6.18	V	5.3	10.1	10.96	33.0	-22.0	
2592.99	10.85	H	5.3	10.1	15.63	33.0	-17.4	
High Ch								
2640.00	4.80	V	5.4	10.1	9.55	33.0	-23.5	
2640.00	10.00	H	5.4	10.1	14.75	33.0	-18.3	

NR Band n77(3450 – 3550 MHz)

100MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2022-03-17 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 100MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>18.46</td><td>V</td><td>6.2</td><td>10.9</td><td>23.19</td><td>30.0</td><td>-6.8</td><td></td></tr><tr><td>3499.98</td><td>19.33</td><td>H</td><td>6.2</td><td>10.9</td><td>24.06</td><td>30.0</td><td>-5.9</td><td></td></tr></table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									3499.98	18.46	V	6.2	10.9	23.19	30.0	-6.8		3499.98	19.33	H	6.2	10.9	24.06	30.0	-5.9	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																												
Mid Ch																																					
3499.98	18.46	V	6.2	10.9	23.19	30.0	-6.8																														
3499.98	19.33	H	6.2	10.9	24.06	30.0	-5.9																														
100MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2022-03-17 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 100MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>16.72</td><td>V</td><td>6.2</td><td>10.9</td><td>21.45</td><td>30.0</td><td>-8.5</td><td></td></tr><tr><td>3499.98</td><td>18.41</td><td>H</td><td>6.2</td><td>10.9</td><td>23.14</td><td>30.0</td><td>-6.9</td><td></td></tr></table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									3499.98	16.72	V	6.2	10.9	21.45	30.0	-8.5		3499.98	18.41	H	6.2	10.9	23.14	30.0	-6.9	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																												
Mid Ch																																					
3499.98	16.72	V	6.2	10.9	21.45	30.0	-8.5																														
3499.98	18.41	H	6.2	10.9	23.14	30.0	-6.9																														

90MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2022-03-17 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 90MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3495.00</td><td>17.60</td><td>V</td><td>6.2</td><td>10.9</td><td>22.34</td><td>30.0</td><td>-7.7</td></tr><tr><td>3495.00</td><td>19.46</td><td>H</td><td>6.2</td><td>10.9</td><td>24.20</td><td>30.0</td><td>-5.8</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>16.77</td><td>V</td><td>6.2</td><td>10.9</td><td>21.50</td><td>30.0</td><td>-8.5</td></tr><tr><td>3499.98</td><td>18.37</td><td>H</td><td>6.2</td><td>10.9</td><td>23.10</td><td>30.0</td><td>-6.9</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3504.00</td><td>16.76</td><td>V</td><td>6.2</td><td>10.9</td><td>21.50</td><td>30.0</td><td>-8.5</td></tr><tr><td>3504.00</td><td>18.79</td><td>H</td><td>6.2</td><td>10.9</td><td>23.53</td><td>30.0</td><td>-6.5</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3495.00	17.60	V	6.2	10.9	22.34	30.0	-7.7	3495.00	19.46	H	6.2	10.9	24.20	30.0	-5.8	Mid Ch								3499.98	16.77	V	6.2	10.9	21.50	30.0	-8.5	3499.98	18.37	H	6.2	10.9	23.10	30.0	-6.9	High Ch								3504.00	16.76	V	6.2	10.9	21.50	30.0	-8.5	3504.00	18.79	H	6.2	10.9	23.53	30.0	-6.5
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	3495.00	17.60	V	6.2	10.9	22.34	30.0	-7.7																																																																																		
	3495.00	19.46	H	6.2	10.9	24.20	30.0	-5.8																																																																																		
	Mid Ch																																																																																									
	3499.98	16.77	V	6.2	10.9	21.50	30.0	-8.5																																																																																		
	3499.98	18.37	H	6.2	10.9	23.10	30.0	-6.9																																																																																		
	High Ch																																																																																									
	3504.00	16.76	V	6.2	10.9	21.50	30.0	-8.5																																																																																		
3504.00	18.79	H	6.2	10.9	23.53	30.0	-6.5																																																																																			
90MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2022-03-17 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 90MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3495.00</td><td>17.01</td><td>V</td><td>6.2</td><td>10.9</td><td>21.75</td><td>30.0</td><td>-8.3</td></tr><tr><td>3495.00</td><td>18.55</td><td>H</td><td>6.2</td><td>10.9</td><td>23.29</td><td>30.0</td><td>-6.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>15.27</td><td>V</td><td>6.2</td><td>10.9</td><td>20.00</td><td>30.0</td><td>-10.0</td></tr><tr><td>3499.98</td><td>17.99</td><td>H</td><td>6.2</td><td>10.9</td><td>22.72</td><td>30.0</td><td>-7.3</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3504.00</td><td>15.56</td><td>V</td><td>6.2</td><td>10.9</td><td>20.30</td><td>30.0</td><td>-9.7</td></tr><tr><td>3504.00</td><td>17.81</td><td>H</td><td>6.2</td><td>10.9</td><td>22.55</td><td>30.0</td><td>-7.5</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3495.00	17.01	V	6.2	10.9	21.75	30.0	-8.3	3495.00	18.55	H	6.2	10.9	23.29	30.0	-6.7	Mid Ch								3499.98	15.27	V	6.2	10.9	20.00	30.0	-10.0	3499.98	17.99	H	6.2	10.9	22.72	30.0	-7.3	High Ch								3504.00	15.56	V	6.2	10.9	20.30	30.0	-9.7	3504.00	17.81	H	6.2	10.9	22.55	30.0	-7.5
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	3495.00	17.01	V	6.2	10.9	21.75	30.0	-8.3																																																																																		
	3495.00	18.55	H	6.2	10.9	23.29	30.0	-6.7																																																																																		
	Mid Ch																																																																																									
	3499.98	15.27	V	6.2	10.9	20.00	30.0	-10.0																																																																																		
	3499.98	17.99	H	6.2	10.9	22.72	30.0	-7.3																																																																																		
	High Ch																																																																																									
	3504.00	15.56	V	6.2	10.9	20.30	30.0	-9.7																																																																																		
3504.00	17.81	H	6.2	10.9	22.55	30.0	-7.5																																																																																			

80MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 80MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3490.00</td><td>17.19</td><td>V</td><td>6.2</td><td>10.9</td><td>21.93</td><td>30.0</td><td>-8.1</td><td></td></tr><tr><td>3490.00</td><td>19.39</td><td>H</td><td>6.2</td><td>10.9</td><td>24.13</td><td>30.0</td><td>-5.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.92</td><td>V</td><td>6.2</td><td>10.9</td><td>21.65</td><td>30.0</td><td>-8.3</td><td></td></tr><tr><td>3499.98</td><td>18.65</td><td>H</td><td>6.2</td><td>10.9</td><td>23.38</td><td>30.0</td><td>-6.6</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3509.00</td><td>16.52</td><td>V</td><td>6.2</td><td>10.9</td><td>21.25</td><td>30.0</td><td>-8.7</td><td></td></tr><tr><td>3509.00</td><td>18.24</td><td>H</td><td>6.2</td><td>10.9</td><td>22.97</td><td>30.0</td><td>-7.0</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3490.00	17.19	V	6.2	10.9	21.93	30.0	-8.1		3490.00	19.39	H	6.2	10.9	24.13	30.0	-5.9		Mid Ch									3499.98	16.92	V	6.2	10.9	21.65	30.0	-8.3		3499.98	18.65	H	6.2	10.9	23.38	30.0	-6.6		High Ch									3509.00	16.52	V	6.2	10.9	21.25	30.0	-8.7		3509.00	18.24	H	6.2	10.9	22.97	30.0	-7.0	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3490.00	17.19	V	6.2	10.9	21.93	30.0	-8.1																																																																																											
	3490.00	19.39	H	6.2	10.9	24.13	30.0	-5.9																																																																																											
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	3499.98	16.92	V	6.2	10.9	21.65	30.0	-8.3																																																																																											
	3499.98	18.65	H	6.2	10.9	23.38	30.0	-6.6																																																																																											
	High Ch																																																																																																		
	3509.00	16.52	V	6.2	10.9	21.25	30.0	-8.7																																																																																											
3509.00	18.24	H	6.2	10.9	22.97	30.0	-7.0																																																																																												
80MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 80MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3490.00</td><td>16.20</td><td>V</td><td>6.2</td><td>10.9</td><td>20.94</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td>3490.00</td><td>18.30</td><td>H</td><td>6.2</td><td>10.9</td><td>23.04</td><td>30.0</td><td>-7.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.18</td><td>V</td><td>6.2</td><td>10.9</td><td>20.91</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td>3499.98</td><td>17.95</td><td>H</td><td>6.2</td><td>10.9</td><td>22.68</td><td>30.0</td><td>-7.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3509.00</td><td>15.53</td><td>V</td><td>6.2</td><td>10.9</td><td>20.26</td><td>30.0</td><td>-9.7</td><td></td></tr><tr><td>3509.00</td><td>17.77</td><td>H</td><td>6.2</td><td>10.9</td><td>22.50</td><td>30.0</td><td>-7.5</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3490.00	16.20	V	6.2	10.9	20.94	30.0	-9.1		3490.00	18.30	H	6.2	10.9	23.04	30.0	-7.0		Mid Ch									3499.98	16.18	V	6.2	10.9	20.91	30.0	-9.1		3499.98	17.95	H	6.2	10.9	22.68	30.0	-7.3		High Ch									3509.00	15.53	V	6.2	10.9	20.26	30.0	-9.7		3509.00	17.77	H	6.2	10.9	22.50	30.0	-7.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	3490.00	16.20	V	6.2	10.9	20.94	30.0	-9.1																																																																																											
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	3499.98	16.18	V	6.2	10.9	20.91	30.0	-9.1																																																																																											
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	3509.00	15.53	V	6.2	10.9	20.26	30.0	-9.7																																																																																											
3509.00	17.77	H	6.2	10.9	22.50	30.0	-7.5																																																																																												

70MHZ QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2022-03-17 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 70MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3485.00</td><td>15.97</td><td>V</td><td>6.2</td><td>10.9</td><td>20.72</td><td>30.0</td><td>-9.3</td></tr><tr><td>3485.00</td><td>19.55</td><td>H</td><td>6.2</td><td>10.9</td><td>24.30</td><td>30.0</td><td>-5.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>15.67</td><td>V</td><td>6.2</td><td>10.9</td><td>20.40</td><td>30.0</td><td>-9.6</td></tr><tr><td>3499.98</td><td>17.61</td><td>H</td><td>6.2</td><td>10.9</td><td>22.34</td><td>30.0</td><td>-7.7</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3542.49</td><td>16.26</td><td>V</td><td>6.2</td><td>11.0</td><td>20.99</td><td>30.0</td><td>-9.0</td></tr><tr><td>3542.49</td><td>18.94</td><td>H</td><td>6.2</td><td>11.0</td><td>23.67</td><td>30.0</td><td>-6.3</td></tr></table>								f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3485.00	15.97	V	6.2	10.9	20.72	30.0	-9.3	3485.00	19.55	H	6.2	10.9	24.30	30.0	-5.7	Mid Ch								3499.98	15.67	V	6.2	10.9	20.40	30.0	-9.6	3499.98	17.61	H	6.2	10.9	22.34	30.0	-7.7	High Ch								3542.49	16.26	V	6.2	11.0	20.99	30.0	-9.0	3542.49	18.94	H	6.2	11.0	23.67	30.0	-6.3
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																
	Low Ch																																																																																								
	3485.00	15.97	V	6.2	10.9	20.72	30.0	-9.3																																																																																	
	3485.00	19.55	H	6.2	10.9	24.30	30.0	-5.7																																																																																	
	Mid Ch																																																																																								
	3499.98	15.67	V	6.2	10.9	20.40	30.0	-9.6																																																																																	
	3499.98	17.61	H	6.2	10.9	22.34	30.0	-7.7																																																																																	
	High Ch																																																																																								
	3542.49	16.26	V	6.2	11.0	20.99	30.0	-9.0																																																																																	
3542.49	18.94	H	6.2	11.0	23.67	30.0	-6.3																																																																																		
70MHZ 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2022-03-17 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 70MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3485.00</td><td>15.80</td><td>V</td><td>6.2</td><td>10.9</td><td>20.55</td><td>30.0</td><td>-9.5</td></tr><tr><td>3485.00</td><td>18.47</td><td>H</td><td>6.2</td><td>10.9</td><td>23.22</td><td>30.0</td><td>-6.8</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>14.99</td><td>V</td><td>6.2</td><td>10.9</td><td>19.72</td><td>30.0</td><td>-10.3</td></tr><tr><td>3499.98</td><td>17.04</td><td>H</td><td>6.2</td><td>10.9</td><td>21.77</td><td>30.0</td><td>-8.2</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3542.49</td><td>15.20</td><td>V</td><td>6.2</td><td>11.0</td><td>19.93</td><td>30.0</td><td>-10.1</td></tr><tr><td>3542.49</td><td>18.24</td><td>H</td><td>6.2</td><td>11.0</td><td>22.97</td><td>30.0</td><td>-7.0</td></tr></table>								f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3485.00	15.80	V	6.2	10.9	20.55	30.0	-9.5	3485.00	18.47	H	6.2	10.9	23.22	30.0	-6.8	Mid Ch								3499.98	14.99	V	6.2	10.9	19.72	30.0	-10.3	3499.98	17.04	H	6.2	10.9	21.77	30.0	-8.2	High Ch								3542.49	15.20	V	6.2	11.0	19.93	30.0	-10.1	3542.49	18.24	H	6.2	11.0	22.97	30.0	-7.0
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																
	Low Ch																																																																																								
	3485.00	15.80	V	6.2	10.9	20.55	30.0	-9.5																																																																																	
	3485.00	18.47	H	6.2	10.9	23.22	30.0	-6.8																																																																																	
	Mid Ch																																																																																								
	3499.98	14.99	V	6.2	10.9	19.72	30.0	-10.3																																																																																	
	3499.98	17.04	H	6.2	10.9	21.77	30.0	-8.2																																																																																	
	High Ch																																																																																								
	3542.49	15.20	V	6.2	11.0	19.93	30.0	-10.1																																																																																	
3542.49	18.24	H	6.2	11.0	22.97	30.0	-7.0																																																																																		

60MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

3/17/2022

19227

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n77 LO Fundamentals, 60MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3480.00	16.33	V	6.2	10.9	21.08	30.0	-8.9	
3480.00	18.29	H	6.2	10.9	23.05	30.0	-7.0	
Mid Ch								
3499.98	15.73	V	6.2	10.9	20.46	30.0	-9.5	
3499.98	17.85	H	6.2	10.9	22.58	30.0	-7.4	
High Ch								
3519.00	15.26	V	6.2	10.9	19.99	30.0	-10.0	
3519.00	17.40	H	6.2	10.9	22.13	30.0	-7.9	

60MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

3/17/2022

19227

EUT, Y-Position

Chamber 2

5G NR_16QAM NR n77 LO Fundamentals, 60MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3480.00	14.99	V	6.2	10.9	19.74	30.0	-10.3	
3480.00	17.34	H	6.2	10.9	22.10	30.0	-7.9	
Mid Ch								
3499.98	15.95	V	6.2	10.9	20.68	30.0	-9.3	
3499.98	17.25	H	6.2	10.9	21.98	30.0	-8.0	
High Ch								
3519.00	14.34	V	6.2	10.9	19.07	30.0	-10.9	
3519.00	15.66	H	6.2	10.9	20.39	30.0	-9.6	

50MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 50MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3475.00</td><td>16.19</td><td>V</td><td>6.2</td><td>10.9</td><td>20.94</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td>3475.00</td><td>18.26</td><td>H</td><td>6.2</td><td>10.9</td><td>23.01</td><td>30.0</td><td>-7.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.45</td><td>V</td><td>6.2</td><td>10.9</td><td>21.18</td><td>30.0</td><td>-8.8</td><td></td></tr><tr><td>3499.98</td><td>17.91</td><td>H</td><td>6.2</td><td>10.9</td><td>22.64</td><td>30.0</td><td>-7.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3524.00</td><td>15.52</td><td>V</td><td>6.2</td><td>11.0</td><td>20.25</td><td>30.0</td><td>-9.7</td><td></td></tr><tr><td>3524.00</td><td>17.43</td><td>H</td><td>6.2</td><td>11.0</td><td>22.16</td><td>30.0</td><td>-7.8</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3475.00	16.19	V	6.2	10.9	20.94	30.0	-9.1		3475.00	18.26	H	6.2	10.9	23.01	30.0	-7.0		Mid Ch									3499.98	16.45	V	6.2	10.9	21.18	30.0	-8.8		3499.98	17.91	H	6.2	10.9	22.64	30.0	-7.4		High Ch									3524.00	15.52	V	6.2	11.0	20.25	30.0	-9.7		3524.00	17.43	H	6.2	11.0	22.16	30.0	-7.8	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3475.00	16.19	V	6.2	10.9	20.94	30.0	-9.1																																																																																											
	3475.00	18.26	H	6.2	10.9	23.01	30.0	-7.0																																																																																											
	Mid Ch																																																																																																		
	3499.98	16.45	V	6.2	10.9	21.18	30.0	-8.8																																																																																											
	3499.98	17.91	H	6.2	10.9	22.64	30.0	-7.4																																																																																											
	High Ch																																																																																																		
	3524.00	15.52	V	6.2	11.0	20.25	30.0	-9.7																																																																																											
3524.00	17.43	H	6.2	11.0	22.16	30.0	-7.8																																																																																												
50MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 50MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3475.00</td><td>15.98</td><td>V</td><td>6.2</td><td>10.9</td><td>20.73</td><td>30.0</td><td>-9.3</td><td></td></tr><tr><td>3475.00</td><td>18.00</td><td>H</td><td>6.2</td><td>10.9</td><td>22.75</td><td>30.0</td><td>-7.2</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.30</td><td>V</td><td>6.2</td><td>10.9</td><td>21.03</td><td>30.0</td><td>-9.0</td><td></td></tr><tr><td>3499.98</td><td>17.71</td><td>H</td><td>6.2</td><td>10.9</td><td>22.44</td><td>30.0</td><td>-7.6</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3524.00</td><td>15.35</td><td>V</td><td>6.2</td><td>11.0</td><td>20.08</td><td>30.0</td><td>-9.9</td><td></td></tr><tr><td>3524.00</td><td>17.79</td><td>H</td><td>6.2</td><td>11.0</td><td>22.52</td><td>30.0</td><td>-7.5</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3475.00	15.98	V	6.2	10.9	20.73	30.0	-9.3		3475.00	18.00	H	6.2	10.9	22.75	30.0	-7.2		Mid Ch									3499.98	16.30	V	6.2	10.9	21.03	30.0	-9.0		3499.98	17.71	H	6.2	10.9	22.44	30.0	-7.6		High Ch									3524.00	15.35	V	6.2	11.0	20.08	30.0	-9.9		3524.00	17.79	H	6.2	11.0	22.52	30.0	-7.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3475.00	15.98	V	6.2	10.9	20.73	30.0	-9.3																																																																																											
	3475.00	18.00	H	6.2	10.9	22.75	30.0	-7.2																																																																																											
	Mid Ch																																																																																																		
	3499.98	16.30	V	6.2	10.9	21.03	30.0	-9.0																																																																																											
	3499.98	17.71	H	6.2	10.9	22.44	30.0	-7.6																																																																																											
	High Ch																																																																																																		
	3524.00	15.35	V	6.2	11.0	20.08	30.0	-9.9																																																																																											
3524.00	17.79	H	6.2	11.0	22.52	30.0	-7.5																																																																																												

40MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 40MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3470.00</td><td>16.19</td><td>V</td><td>6.2</td><td>10.9</td><td>20.95</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td>3470.00</td><td>18.40</td><td>H</td><td>6.2</td><td>10.9</td><td>23.16</td><td>30.0</td><td>-6.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.08</td><td>V</td><td>6.2</td><td>10.9</td><td>20.81</td><td>30.0</td><td>-9.2</td><td></td></tr><tr><td>3499.98</td><td>18.48</td><td>H</td><td>6.2</td><td>10.9</td><td>23.21</td><td>30.0</td><td>-6.8</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3529.00</td><td>15.62</td><td>V</td><td>6.2</td><td>11.0</td><td>20.35</td><td>30.0</td><td>-9.6</td><td></td></tr><tr><td>3529.00</td><td>18.01</td><td>H</td><td>6.2</td><td>11.0</td><td>22.74</td><td>30.0</td><td>-7.3</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3470.00	16.19	V	6.2	10.9	20.95	30.0	-9.1		3470.00	18.40	H	6.2	10.9	23.16	30.0	-6.8		Mid Ch									3499.98	16.08	V	6.2	10.9	20.81	30.0	-9.2		3499.98	18.48	H	6.2	10.9	23.21	30.0	-6.8		High Ch									3529.00	15.62	V	6.2	11.0	20.35	30.0	-9.6		3529.00	18.01	H	6.2	11.0	22.74	30.0	-7.3	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3470.00	16.19	V	6.2	10.9	20.95	30.0	-9.1																																																																																											
	3470.00	18.40	H	6.2	10.9	23.16	30.0	-6.8																																																																																											
	Mid Ch																																																																																																		
	3499.98	16.08	V	6.2	10.9	20.81	30.0	-9.2																																																																																											
	3499.98	18.48	H	6.2	10.9	23.21	30.0	-6.8																																																																																											
	High Ch																																																																																																		
	3529.00	15.62	V	6.2	11.0	20.35	30.0	-9.6																																																																																											
3529.00	18.01	H	6.2	11.0	22.74	30.0	-7.3																																																																																												
40MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 40MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3470.00</td><td>15.46</td><td>V</td><td>6.2</td><td>10.9</td><td>20.22</td><td>30.0</td><td>-9.8</td><td></td></tr><tr><td>3470.00</td><td>17.58</td><td>H</td><td>6.2</td><td>10.9</td><td>22.34</td><td>30.0</td><td>-7.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>15.00</td><td>V</td><td>6.2</td><td>10.9</td><td>19.73</td><td>30.0</td><td>-10.3</td><td></td></tr><tr><td>3499.98</td><td>17.72</td><td>H</td><td>6.2</td><td>10.9</td><td>22.45</td><td>30.0</td><td>-7.5</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3529.00</td><td>14.36</td><td>V</td><td>6.2</td><td>11.0</td><td>19.09</td><td>30.0</td><td>-10.9</td><td></td></tr><tr><td>3529.00</td><td>17.07</td><td>H</td><td>6.2</td><td>11.0</td><td>21.80</td><td>30.0</td><td>-8.2</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3470.00	15.46	V	6.2	10.9	20.22	30.0	-9.8		3470.00	17.58	H	6.2	10.9	22.34	30.0	-7.7		Mid Ch									3499.98	15.00	V	6.2	10.9	19.73	30.0	-10.3		3499.98	17.72	H	6.2	10.9	22.45	30.0	-7.5		High Ch									3529.00	14.36	V	6.2	11.0	19.09	30.0	-10.9		3529.00	17.07	H	6.2	11.0	21.80	30.0	-8.2	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3470.00	15.46	V	6.2	10.9	20.22	30.0	-9.8																																																																																											
	3470.00	17.58	H	6.2	10.9	22.34	30.0	-7.7																																																																																											
	Mid Ch																																																																																																		
	3499.98	15.00	V	6.2	10.9	19.73	30.0	-10.3																																																																																											
	3499.98	17.72	H	6.2	10.9	22.45	30.0	-7.5																																																																																											
	High Ch																																																																																																		
	3529.00	14.36	V	6.2	11.0	19.09	30.0	-10.9																																																																																											
3529.00	17.07	H	6.2	11.0	21.80	30.0	-8.2																																																																																												

30MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 30MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3465.00</td><td>16.27</td><td>V</td><td>6.2</td><td>10.9</td><td>21.03</td><td>30.0</td><td>-9.0</td><td></td></tr><tr><td>3465.00</td><td>17.53</td><td>H</td><td>6.2</td><td>10.9</td><td>22.29</td><td>30.0</td><td>-7.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.30</td><td>V</td><td>6.2</td><td>10.9</td><td>21.03</td><td>30.0</td><td>-9.0</td><td></td></tr><tr><td>3499.98</td><td>17.99</td><td>H</td><td>6.2</td><td>10.9</td><td>22.72</td><td>30.0</td><td>-7.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3535.02</td><td>16.35</td><td>V</td><td>6.2</td><td>11.0</td><td>21.08</td><td>30.0</td><td>-8.9</td><td></td></tr><tr><td>3535.02</td><td>18.42</td><td>H</td><td>6.2</td><td>11.0</td><td>23.14</td><td>30.0</td><td>-6.9</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3465.00	16.27	V	6.2	10.9	21.03	30.0	-9.0		3465.00	17.53	H	6.2	10.9	22.29	30.0	-7.7		Mid Ch									3499.98	16.30	V	6.2	10.9	21.03	30.0	-9.0		3499.98	17.99	H	6.2	10.9	22.72	30.0	-7.3		High Ch									3535.02	16.35	V	6.2	11.0	21.08	30.0	-8.9		3535.02	18.42	H	6.2	11.0	23.14	30.0	-6.9	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3465.00	16.27	V	6.2	10.9	21.03	30.0	-9.0																																																																																											
	3465.00	17.53	H	6.2	10.9	22.29	30.0	-7.7																																																																																											
	Mid Ch																																																																																																		
	3499.98	16.30	V	6.2	10.9	21.03	30.0	-9.0																																																																																											
	3499.98	17.99	H	6.2	10.9	22.72	30.0	-7.3																																																																																											
	High Ch																																																																																																		
	3535.02	16.35	V	6.2	11.0	21.08	30.0	-8.9																																																																																											
3535.02	18.42	H	6.2	11.0	23.14	30.0	-6.9																																																																																												
30MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 30MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3465.00</td><td>15.91</td><td>V</td><td>6.2</td><td>10.9</td><td>20.67</td><td>30.0</td><td>-9.3</td><td></td></tr><tr><td>3465.00</td><td>17.08</td><td>H</td><td>6.2</td><td>10.9</td><td>21.84</td><td>30.0</td><td>-8.2</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>15.92</td><td>V</td><td>6.2</td><td>10.9</td><td>20.65</td><td>30.0</td><td>-9.3</td><td></td></tr><tr><td>3499.98</td><td>17.26</td><td>H</td><td>6.2</td><td>10.9</td><td>21.99</td><td>30.0</td><td>-8.0</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3535.02</td><td>15.82</td><td>V</td><td>6.2</td><td>11.0</td><td>20.55</td><td>30.0</td><td>-9.5</td><td></td></tr><tr><td>3535.02</td><td>17.83</td><td>H</td><td>6.2</td><td>11.0</td><td>22.55</td><td>30.0</td><td>-7.4</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3465.00	15.91	V	6.2	10.9	20.67	30.0	-9.3		3465.00	17.08	H	6.2	10.9	21.84	30.0	-8.2		Mid Ch									3499.98	15.92	V	6.2	10.9	20.65	30.0	-9.3		3499.98	17.26	H	6.2	10.9	21.99	30.0	-8.0		High Ch									3535.02	15.82	V	6.2	11.0	20.55	30.0	-9.5		3535.02	17.83	H	6.2	11.0	22.55	30.0	-7.4	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3465.00	15.91	V	6.2	10.9	20.67	30.0	-9.3																																																																																											
	3465.00	17.08	H	6.2	10.9	21.84	30.0	-8.2																																																																																											
	Mid Ch																																																																																																		
	3499.98	15.92	V	6.2	10.9	20.65	30.0	-9.3																																																																																											
	3499.98	17.26	H	6.2	10.9	21.99	30.0	-8.0																																																																																											
	High Ch																																																																																																		
	3535.02	15.82	V	6.2	11.0	20.55	30.0	-9.5																																																																																											
3535.02	17.83	H	6.2	11.0	22.55	30.0	-7.4																																																																																												

20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3460.00</td><td>15.58</td><td>V</td><td>6.2</td><td>10.9</td><td>20.34</td><td>30.0</td><td>-9.7</td><td></td></tr><tr><td>3460.00</td><td>18.26</td><td>H</td><td>6.2</td><td>10.9</td><td>23.02</td><td>30.0</td><td>-7.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.63</td><td>V</td><td>6.2</td><td>10.9</td><td>21.36</td><td>30.0</td><td>-8.6</td><td></td></tr><tr><td>3499.98</td><td>18.52</td><td>H</td><td>6.2</td><td>10.9</td><td>23.25</td><td>30.0</td><td>-6.7</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3539.00</td><td>16.14</td><td>V</td><td>6.2</td><td>11.0</td><td>20.87</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td>3539.00</td><td>18.67</td><td>H</td><td>6.2</td><td>11.0</td><td>23.40</td><td>30.0</td><td>-6.6</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3460.00	15.58	V	6.2	10.9	20.34	30.0	-9.7		3460.00	18.26	H	6.2	10.9	23.02	30.0	-7.0		Mid Ch									3499.98	16.63	V	6.2	10.9	21.36	30.0	-8.6		3499.98	18.52	H	6.2	10.9	23.25	30.0	-6.7		High Ch									3539.00	16.14	V	6.2	11.0	20.87	30.0	-9.1		3539.00	18.67	H	6.2	11.0	23.40	30.0	-6.6	
	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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	3460.00	15.58	V	6.2	10.9	20.34	30.0	-9.7																																																																																											
	3460.00	18.26	H	6.2	10.9	23.02	30.0	-7.0																																																																																											
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	3499.98	16.63	V	6.2	10.9	21.36	30.0	-8.6																																																																																											
	3499.98	18.52	H	6.2	10.9	23.25	30.0	-6.7																																																																																											
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	3539.00	16.14	V	6.2	11.0	20.87	30.0	-9.1																																																																																											
3539.00	18.67	H	6.2	11.0	23.40	30.0	-6.6																																																																																												
20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3460.00</td><td>15.25</td><td>V</td><td>6.2</td><td>10.9</td><td>20.01</td><td>30.0</td><td>-10.0</td><td></td></tr><tr><td>3460.00</td><td>18.07</td><td>H</td><td>6.2</td><td>10.9</td><td>22.83</td><td>30.0</td><td>-7.2</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3499.98</td><td>16.19</td><td>V</td><td>6.2</td><td>10.9</td><td>20.92</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td>3499.98</td><td>18.13</td><td>H</td><td>6.2</td><td>10.9</td><td>22.86</td><td>30.0</td><td>-7.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3539.00</td><td>15.75</td><td>V</td><td>6.2</td><td>11.0</td><td>20.48</td><td>30.0</td><td>-9.5</td><td></td></tr><tr><td>3539.00</td><td>18.11</td><td>H</td><td>6.2</td><td>11.0</td><td>22.84</td><td>30.0</td><td>-7.2</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3460.00	15.25	V	6.2	10.9	20.01	30.0	-10.0		3460.00	18.07	H	6.2	10.9	22.83	30.0	-7.2		Mid Ch									3499.98	16.19	V	6.2	10.9	20.92	30.0	-9.1		3499.98	18.13	H	6.2	10.9	22.86	30.0	-7.1		High Ch									3539.00	15.75	V	6.2	11.0	20.48	30.0	-9.5		3539.00	18.11	H	6.2	11.0	22.84	30.0	-7.2	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	3460.00	15.25	V	6.2	10.9	20.01	30.0	-10.0																																																																																											
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	3499.98	16.19	V	6.2	10.9	20.92	30.0	-9.1																																																																																											
	3499.98	18.13	H	6.2	10.9	22.86	30.0	-7.1																																																																																											
	High Ch																																																																																																		
	3539.00	15.75	V	6.2	11.0	20.48	30.0	-9.5																																																																																											
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15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3457.50</td><td>15.76</td><td>V</td><td>6.2</td><td>10.9</td><td>20.53</td><td>30.0</td><td>-9.5</td></tr><tr><td>3457.50</td><td>17.99</td><td>H</td><td>6.2</td><td>10.9</td><td>22.76</td><td>30.0</td><td>-7.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>16.27</td><td>V</td><td>6.2</td><td>10.9</td><td>21.00</td><td>30.0</td><td>-9.0</td></tr><tr><td>3499.98</td><td>18.81</td><td>H</td><td>6.2</td><td>10.9</td><td>23.54</td><td>30.0</td><td>-6.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3542.49</td><td>15.06</td><td>V</td><td>6.2</td><td>11.0</td><td>19.79</td><td>30.0</td><td>-10.2</td></tr><tr><td>3542.49</td><td>17.82</td><td>H</td><td>6.2</td><td>11.0</td><td>22.55</td><td>30.0</td><td>-7.5</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3457.50	15.76	V	6.2	10.9	20.53	30.0	-9.5	3457.50	17.99	H	6.2	10.9	22.76	30.0	-7.2	Mid Ch								3499.98	16.27	V	6.2	10.9	21.00	30.0	-9.0	3499.98	18.81	H	6.2	10.9	23.54	30.0	-6.5	High Ch								3542.49	15.06	V	6.2	11.0	19.79	30.0	-10.2	3542.49	17.82	H	6.2	11.0	22.55	30.0	-7.5
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	3457.50	15.76	V	6.2	10.9	20.53	30.0	-9.5																																																																																		
	3457.50	17.99	H	6.2	10.9	22.76	30.0	-7.2																																																																																		
	Mid Ch																																																																																									
	3499.98	16.27	V	6.2	10.9	21.00	30.0	-9.0																																																																																		
	3499.98	18.81	H	6.2	10.9	23.54	30.0	-6.5																																																																																		
	High Ch																																																																																									
	3542.49	15.06	V	6.2	11.0	19.79	30.0	-10.2																																																																																		
3542.49	17.82	H	6.2	11.0	22.55	30.0	-7.5																																																																																			
15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3457.50</td><td>15.01</td><td>V</td><td>6.2</td><td>10.9</td><td>19.78</td><td>30.0</td><td>-10.2</td></tr><tr><td>3457.50</td><td>17.59</td><td>H</td><td>6.2</td><td>10.9</td><td>22.36</td><td>30.0</td><td>-7.6</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>15.57</td><td>V</td><td>6.2</td><td>10.9</td><td>20.30</td><td>30.0</td><td>-9.7</td></tr><tr><td>3499.98</td><td>17.26</td><td>H</td><td>6.2</td><td>10.9</td><td>21.99</td><td>30.0</td><td>-8.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3542.49</td><td>14.56</td><td>V</td><td>6.2</td><td>11.0</td><td>19.29</td><td>30.0</td><td>-10.7</td></tr><tr><td>3542.49</td><td>17.39</td><td>H</td><td>6.2</td><td>11.0</td><td>22.12</td><td>30.0</td><td>-7.9</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3457.50	15.01	V	6.2	10.9	19.78	30.0	-10.2	3457.50	17.59	H	6.2	10.9	22.36	30.0	-7.6	Mid Ch								3499.98	15.57	V	6.2	10.9	20.30	30.0	-9.7	3499.98	17.26	H	6.2	10.9	21.99	30.0	-8.0	High Ch								3542.49	14.56	V	6.2	11.0	19.29	30.0	-10.7	3542.49	17.39	H	6.2	11.0	22.12	30.0	-7.9
	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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	3457.50	15.01	V	6.2	10.9	19.78	30.0	-10.2																																																																																		
	3457.50	17.59	H	6.2	10.9	22.36	30.0	-7.6																																																																																		
	Mid Ch																																																																																									
	3499.98	15.57	V	6.2	10.9	20.30	30.0	-9.7																																																																																		
	3499.98	17.26	H	6.2	10.9	21.99	30.0	-8.0																																																																																		
	High Ch																																																																																									
	3542.49	14.56	V	6.2	11.0	19.29	30.0	-10.7																																																																																		
3542.49	17.39	H	6.2	11.0	22.12	30.0	-7.9																																																																																			

10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3455.00</td><td>15.85</td><td>V</td><td>6.2</td><td>10.9</td><td>20.62</td><td>30.0</td><td>-9.4</td></tr><tr><td>3455.00</td><td>18.27</td><td>H</td><td>6.2</td><td>10.9</td><td>23.03</td><td>30.0</td><td>-7.0</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>16.44</td><td>V</td><td>6.2</td><td>10.9</td><td>21.17</td><td>30.0</td><td>-8.8</td></tr><tr><td>3499.98</td><td>18.14</td><td>H</td><td>6.2</td><td>10.9</td><td>22.87</td><td>30.0</td><td>-7.1</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3542.49</td><td>15.43</td><td>V</td><td>6.2</td><td>11.0</td><td>20.16</td><td>30.0</td><td>-9.8</td></tr><tr><td>3542.49</td><td>17.89</td><td>H</td><td>6.2</td><td>11.0</td><td>22.62</td><td>30.0</td><td>-7.4</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3455.00	15.85	V	6.2	10.9	20.62	30.0	-9.4	3455.00	18.27	H	6.2	10.9	23.03	30.0	-7.0	Mid Ch								3499.98	16.44	V	6.2	10.9	21.17	30.0	-8.8	3499.98	18.14	H	6.2	10.9	22.87	30.0	-7.1	High Ch								3542.49	15.43	V	6.2	11.0	20.16	30.0	-9.8	3542.49	17.89	H	6.2	11.0	22.62	30.0	-7.4
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	3455.00	15.85	V	6.2	10.9	20.62	30.0	-9.4																																																																																		
	3455.00	18.27	H	6.2	10.9	23.03	30.0	-7.0																																																																																		
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	3499.98	16.44	V	6.2	10.9	21.17	30.0	-8.8																																																																																		
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3542.49	17.89	H	6.2	11.0	22.62	30.0	-7.4																																																																																			
10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 3/17/2022 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 LO Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3455.00</td><td>14.98</td><td>V</td><td>6.2</td><td>10.9</td><td>19.75</td><td>30.0</td><td>-10.3</td></tr><tr><td>3455.00</td><td>17.99</td><td>H</td><td>6.2</td><td>10.9</td><td>22.75</td><td>30.0</td><td>-7.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3499.98</td><td>15.14</td><td>V</td><td>6.2</td><td>10.9</td><td>19.87</td><td>30.0</td><td>-10.1</td></tr><tr><td>3499.98</td><td>17.75</td><td>H</td><td>6.2</td><td>10.9</td><td>22.48</td><td>30.0</td><td>-7.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3542.49</td><td>14.90</td><td>V</td><td>6.2</td><td>11.0</td><td>19.63</td><td>30.0</td><td>-10.4</td></tr><tr><td>3542.49</td><td>17.46</td><td>H</td><td>6.2</td><td>11.0</td><td>22.19</td><td>30.0</td><td>-7.8</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								3455.00	14.98	V	6.2	10.9	19.75	30.0	-10.3	3455.00	17.99	H	6.2	10.9	22.75	30.0	-7.2	Mid Ch								3499.98	15.14	V	6.2	10.9	19.87	30.0	-10.1	3499.98	17.75	H	6.2	10.9	22.48	30.0	-7.5	High Ch								3542.49	14.90	V	6.2	11.0	19.63	30.0	-10.4	3542.49	17.46	H	6.2	11.0	22.19	30.0	-7.8
	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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	3455.00	14.98	V	6.2	10.9	19.75	30.0	-10.3																																																																																		
	3455.00	17.99	H	6.2	10.9	22.75	30.0	-7.2																																																																																		
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	3499.98	15.14	V	6.2	10.9	19.87	30.0	-10.1																																																																																		
	3499.98	17.75	H	6.2	10.9	22.48	30.0	-7.5																																																																																		
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	3542.49	14.90	V	6.2	11.0	19.63	30.0	-10.4																																																																																		
3542.49	17.46	H	6.2	11.0	22.19	30.0	-7.8																																																																																			

NR Band n77(3450 – 3550 MHz, SRS1)

100MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/17/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 100MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <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>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3499.98</td> <td>7.96</td> <td>V</td> <td>6.2</td> <td>10.9</td> <td>12.69</td> <td>30.0</td> <td>-17.3</td> <td></td> </tr> <tr> <td>3499.98</td> <td>9.44</td> <td>H</td> <td>6.2</td> <td>10.9</td> <td>14.17</td> <td>30.0</td> <td>-15.8</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	Mid Ch									3499.98	7.96	V	6.2	10.9	12.69	30.0	-17.3		3499.98	9.44	H	6.2	10.9	14.17	30.0	-15.8	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																													
Mid Ch																																					
3499.98	7.96	V	6.2	10.9	12.69	30.0	-17.3																														
3499.98	9.44	H	6.2	10.9	14.17	30.0	-15.8																														

NR Band n77(3450 – 3550 MHz, SRS2)

100MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/17/2022 Test Engineer: 19227 Configuration: EUT, Z-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 100MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <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>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3499.98</td> <td>10.73</td> <td>V</td> <td>6.2</td> <td>10.9</td> <td>15.46</td> <td>30.0</td> <td>-14.5</td> <td></td> </tr> <tr> <td>3499.98</td> <td>14.48</td> <td>H</td> <td>6.2</td> <td>10.9</td> <td>19.21</td> <td>30.0</td> <td>-10.8</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	Mid Ch									3499.98	10.73	V	6.2	10.9	15.46	30.0	-14.5		3499.98	14.48	H	6.2	10.9	19.21	30.0	-10.8	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																													
Mid Ch																																					
3499.98	10.73	V	6.2	10.9	15.46	30.0	-14.5																														
3499.98	14.48	H	6.2	10.9	19.21	30.0	-10.8																														

NR Band n77(3450 – 3550 MHz, SRS3)

100MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/17/2022 Test Engineer: 19227 Configuration: EUT, Z-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Fundamentals, 100MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">f MHz</th> <th style="text-align: center;">SG reading (dBm)</th> <th style="text-align: center;">Ant. Pol. (H/V)</th> <th style="text-align: center;">Cable Loss (dB)</th> <th style="text-align: center;">Antenna Gain (dBi)</th> <th style="text-align: center;">EIRP (dBm)</th> <th style="text-align: center;">Limit (dBm)</th> <th style="text-align: center;">Delta (dB)</th> <th style="text-align: center;">Notes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3499.98</td> <td style="text-align: center;">9.73</td> <td style="text-align: center;">V</td> <td style="text-align: center;">6.2</td> <td style="text-align: center;">10.9</td> <td style="text-align: center;">14.46</td> <td style="text-align: center;">30.0</td> <td style="text-align: center;">-15.5</td> <td></td> </tr> <tr> <td style="text-align: center;">3499.98</td> <td style="text-align: center;">4.52</td> <td style="text-align: center;">H</td> <td style="text-align: center;">6.2</td> <td style="text-align: center;">10.9</td> <td style="text-align: center;">9.25</td> <td style="text-align: center;">30.0</td> <td style="text-align: center;">-20.7</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	Mid Ch									3499.98	9.73	V	6.2	10.9	14.46	30.0	-15.5		3499.98	4.52	H	6.2	10.9	9.25	30.0	-20.7	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																													
Mid Ch																																					
3499.98	9.73	V	6.2	10.9	14.46	30.0	-15.5																														
3499.98	4.52	H	6.2	10.9	9.25	30.0	-20.7																														

NR Band n77 (3700 ~ 3980 MHz)

100MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/10/2022

25546

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3750.00	18.73	V	6.4	10.5	22.85	30.0	-7.1	
3750.00	21.30	H	6.4	10.5	25.42	30.0	-4.6	
Mid Ch								
3840.00	18.31	V	6.5	10.3	22.13	30.0	-7.9	
3840.00	19.31	H	6.5	10.3	23.13	30.0	-6.9	
High Ch								
3930.00	19.26	V	6.6	10.2	22.92	30.0	-7.1	
3930.00	19.84	H	6.6	10.2	23.50	30.0	-6.5	

100MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/10/2022

25546

EUT, Y-Position

Chamber 2

5G NR_16QAM NR n77 UP Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3750.00	17.94	V	6.4	10.5	22.06	30.0	-7.9	
3750.00	20.20	H	6.4	10.5	24.32	30.0	-5.7	
Mid Ch								
3840.00	18.10	V	6.5	10.3	21.92	30.0	-8.1	
3840.00	18.90	H	6.5	10.3	22.72	30.0	-7.3	
High Ch								
3930.00	18.96	V	6.6	10.2	22.62	30.0	-7.4	
3930.00	19.54	H	6.6	10.2	23.20	30.0	-6.8	

90MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/10/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G_NR_QPSK NR n77 UP Fundamentals, 90MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3745.00</td><td>18.41</td><td>V</td><td>6.4</td><td>10.6</td><td>22.54</td><td>30.0</td><td>-7.5</td><td></td></tr><tr><td>3745.00</td><td>20.47</td><td>H</td><td>6.4</td><td>10.6</td><td>24.60</td><td>30.0</td><td>-5.4</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3840.00</td><td>18.29</td><td>V</td><td>6.5</td><td>10.3</td><td>22.11</td><td>30.0</td><td>-7.9</td><td></td></tr><tr><td>3840.00</td><td>18.95</td><td>H</td><td>6.5</td><td>10.3</td><td>22.77</td><td>30.0</td><td>-7.2</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3935.00</td><td>18.50</td><td>V</td><td>6.6</td><td>10.2</td><td>22.16</td><td>30.0</td><td>-7.8</td><td></td></tr><tr><td>3935.00</td><td>19.84</td><td>H</td><td>6.6</td><td>10.2</td><td>23.49</td><td>30.0</td><td>-6.5</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3745.00	18.41	V	6.4	10.6	22.54	30.0	-7.5		3745.00	20.47	H	6.4	10.6	24.60	30.0	-5.4		Mid Ch									3840.00	18.29	V	6.5	10.3	22.11	30.0	-7.9		3840.00	18.95	H	6.5	10.3	22.77	30.0	-7.2		High Ch									3935.00	18.50	V	6.6	10.2	22.16	30.0	-7.8		3935.00	19.84	H	6.6	10.2	23.49	30.0	-6.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	3840.00	18.95	H	6.5	10.3	22.77	30.0	-7.2																																																																																											
	High Ch																																																																																																		
	3935.00	18.50	V	6.6	10.2	22.16	30.0	-7.8																																																																																											
3935.00	19.84	H	6.6	10.2	23.49	30.0	-6.5																																																																																												
90MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/10/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G_NR_16QAM NR n77 UP Fundamentals, 90MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3745.00</td><td>17.54</td><td>V</td><td>6.4</td><td>10.6</td><td>21.67</td><td>30.0</td><td>-8.3</td><td></td></tr><tr><td>3745.00</td><td>19.38</td><td>H</td><td>6.4</td><td>10.6</td><td>23.51</td><td>30.0</td><td>-6.5</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3840.00</td><td>17.52</td><td>V</td><td>6.5</td><td>10.3</td><td>21.34</td><td>30.0</td><td>-8.7</td><td></td></tr><tr><td>3840.00</td><td>18.40</td><td>H</td><td>6.5</td><td>10.3</td><td>22.22</td><td>30.0</td><td>-7.8</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3935.00</td><td>18.18</td><td>V</td><td>6.6</td><td>10.2</td><td>21.84</td><td>30.0</td><td>-8.2</td><td></td></tr><tr><td>3935.00</td><td>19.41</td><td>H</td><td>6.6</td><td>10.2</td><td>23.06</td><td>30.0</td><td>-6.9</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3745.00	17.54	V	6.4	10.6	21.67	30.0	-8.3		3745.00	19.38	H	6.4	10.6	23.51	30.0	-6.5		Mid Ch									3840.00	17.52	V	6.5	10.3	21.34	30.0	-8.7		3840.00	18.40	H	6.5	10.3	22.22	30.0	-7.8		High Ch									3935.00	18.18	V	6.6	10.2	21.84	30.0	-8.2		3935.00	19.41	H	6.6	10.2	23.06	30.0	-6.9	
	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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	3840.00	17.52	V	6.5	10.3	21.34	30.0	-8.7																																																																																											
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80MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/10/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 UP Fundamentals, 80MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3740.00</td><td>17.24</td><td>V</td><td>6.4</td><td>10.6</td><td>21.40</td><td>30.0</td><td>-8.6</td><td></td></tr><tr><td>3740.00</td><td>18.93</td><td>H</td><td>6.4</td><td>10.6</td><td>23.09</td><td>30.0</td><td>-6.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3840.00</td><td>18.14</td><td>V</td><td>6.5</td><td>10.3</td><td>21.96</td><td>30.0</td><td>-8.0</td><td></td></tr><tr><td>3840.00</td><td>19.32</td><td>H</td><td>6.5</td><td>10.3</td><td>23.14</td><td>30.0</td><td>-6.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3940.00</td><td>17.37</td><td>V</td><td>6.6</td><td>10.2</td><td>21.02</td><td>30.0</td><td>-9.0</td><td></td></tr><tr><td>3940.00</td><td>18.61</td><td>H</td><td>6.6</td><td>10.2</td><td>22.25</td><td>30.0</td><td>-7.7</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3740.00	17.24	V	6.4	10.6	21.40	30.0	-8.6		3740.00	18.93	H	6.4	10.6	23.09	30.0	-6.9		Mid Ch									3840.00	18.14	V	6.5	10.3	21.96	30.0	-8.0		3840.00	19.32	H	6.5	10.3	23.14	30.0	-6.9		High Ch									3940.00	17.37	V	6.6	10.2	21.02	30.0	-9.0		3940.00	18.61	H	6.6	10.2	22.25	30.0	-7.7	
	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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80MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/10/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 UP Fundamentals, 80MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3740.00</td><td>16.37</td><td>V</td><td>6.4</td><td>10.6</td><td>20.53</td><td>30.0</td><td>-9.5</td><td></td></tr><tr><td>3740.00</td><td>18.13</td><td>H</td><td>6.4</td><td>10.6</td><td>22.29</td><td>30.0</td><td>-7.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3840.00</td><td>17.16</td><td>V</td><td>6.5</td><td>10.3</td><td>20.98</td><td>30.0</td><td>-9.0</td><td></td></tr><tr><td>3840.00</td><td>19.16</td><td>H</td><td>6.5</td><td>10.3</td><td>22.98</td><td>30.0</td><td>-7.0</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3940.00</td><td>16.43</td><td>V</td><td>6.6</td><td>10.2</td><td>20.08</td><td>30.0</td><td>-9.9</td><td></td></tr><tr><td>3940.00</td><td>18.15</td><td>H</td><td>6.6</td><td>10.2</td><td>21.79</td><td>30.0</td><td>-8.2</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3740.00	16.37	V	6.4	10.6	20.53	30.0	-9.5		3740.00	18.13	H	6.4	10.6	22.29	30.0	-7.7		Mid Ch									3840.00	17.16	V	6.5	10.3	20.98	30.0	-9.0		3840.00	19.16	H	6.5	10.3	22.98	30.0	-7.0		High Ch									3940.00	16.43	V	6.6	10.2	20.08	30.0	-9.9		3940.00	18.15	H	6.6	10.2	21.79	30.0	-8.2	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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70MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/16/2022 Test Engineer: 19227 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 UP Fundamentals, 70MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3735.00</td><td>19.20</td><td>V</td><td>6.4</td><td>10.6</td><td>23.37</td><td>30.0</td><td>-6.6</td><td></td></tr><tr><td>3735.00</td><td>19.97</td><td>H</td><td>6.4</td><td>10.6</td><td>24.15</td><td>30.0</td><td>-5.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3840.00</td><td>19.61</td><td>V</td><td>6.5</td><td>10.3</td><td>23.43</td><td>30.0</td><td>-6.6</td><td></td></tr><tr><td>3840.00</td><td>20.01</td><td>H</td><td>6.5</td><td>10.3</td><td>23.83</td><td>30.0</td><td>-6.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3945.00</td><td>18.63</td><td>V</td><td>6.6</td><td>10.2</td><td>22.27</td><td>30.0</td><td>-7.7</td><td></td></tr><tr><td>3945.00</td><td>19.40</td><td>H</td><td>6.6</td><td>10.2</td><td>23.04</td><td>30.0</td><td>-7.0</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3735.00	19.20	V	6.4	10.6	23.37	30.0	-6.6		3735.00	19.97	H	6.4	10.6	24.15	30.0	-5.8		Mid Ch									3840.00	19.61	V	6.5	10.3	23.43	30.0	-6.6		3840.00	20.01	H	6.5	10.3	23.83	30.0	-6.2		High Ch									3945.00	18.63	V	6.6	10.2	22.27	30.0	-7.7		3945.00	19.40	H	6.6	10.2	23.04	30.0	-7.0	
	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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	3840.00	19.61	V	6.5	10.3	23.43	30.0	-6.6																																																																																											
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	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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	3735.00	19.02	H	6.4	10.6	23.20	30.0	-6.8																																																																																											
	Mid Ch																																																																																																		
	3840.00	18.50	V	6.5	10.3	22.32	30.0	-7.7																																																																																											
	3840.00	19.24	H	6.5	10.3	23.06	30.0	-6.9																																																																																											
	High Ch																																																																																																		
	3945.00	17.73	V	6.6	10.2	21.37	30.0	-8.6																																																																																											
3945.00	18.89	H	6.6	10.2	22.53	30.0	-7.5																																																																																												

60MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4790270388

Date:

2/10/2022

Test Engineer:

25546

Configuration:

EUT, Y-Position

Location:

Chamber 2

Mode:

5G NR_QPSK NR n77 UP Fundamentals, 60MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3730.00	17.63	V	6.4	10.6	21.82	30.0	-8.2	
3730.00	19.81	H	6.4	10.6	24.01	30.0	-6.0	
Mid Ch								
3840.00	18.02	V	6.5	10.3	21.84	30.0	-8.2	
3840.00	19.85	H	6.5	10.3	23.67	30.0	-6.3	
High Ch								
3950.00	18.12	V	6.6	10.2	21.76	30.0	-8.2	
3950.00	19.63	H	6.6	10.2	23.27	30.0	-6.7	

60MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4790270388

Date:

2/10/2022

Test Engineer:

25546

Configuration:

EUT, Y-Position

Location:

Chamber 2

Mode:

5G NR_16QAM NR n77 UP Fundamentals, 60MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3730.00	16.46	V	6.4	10.6	20.65	30.0	-9.3	
3730.00	18.92	H	6.4	10.6	23.12	30.0	-6.9	
Mid Ch								
3840.00	17.12	V	6.5	10.3	20.94	30.0	-9.1	
3840.00	18.88	H	6.5	10.3	22.70	30.0	-7.3	
High Ch								
3950.00	17.51	V	6.6	10.2	21.15	30.0	-8.9	
3950.00	18.79	H	6.6	10.2	22.43	30.0	-7.6	

50MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/10/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 UP Fundamentals, 50MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3725.00</td><td>17.42</td><td>V</td><td>6.4</td><td>10.6</td><td>21.64</td><td>30.0</td><td>-8.4</td><td></td></tr><tr><td>3725.00</td><td>19.49</td><td>H</td><td>6.4</td><td>10.6</td><td>23.71</td><td>30.0</td><td>-6.3</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3840.00</td><td>18.79</td><td>V</td><td>6.5</td><td>10.3</td><td>22.61</td><td>30.0</td><td>-7.4</td><td></td></tr><tr><td>3840.00</td><td>20.08</td><td>H</td><td>6.5</td><td>10.3</td><td>23.90</td><td>30.0</td><td>-6.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3955.00</td><td>17.77</td><td>V</td><td>6.6</td><td>10.2</td><td>21.41</td><td>30.0</td><td>-8.6</td><td></td></tr><tr><td>3955.00</td><td>19.63</td><td>H</td><td>6.6</td><td>10.2</td><td>23.26</td><td>30.0</td><td>-6.7</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3725.00	17.42	V	6.4	10.6	21.64	30.0	-8.4		3725.00	19.49	H	6.4	10.6	23.71	30.0	-6.3		Mid Ch									3840.00	18.79	V	6.5	10.3	22.61	30.0	-7.4		3840.00	20.08	H	6.5	10.3	23.90	30.0	-6.1		High Ch									3955.00	17.77	V	6.6	10.2	21.41	30.0	-8.6		3955.00	19.63	H	6.6	10.2	23.26	30.0	-6.7	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3725.00	17.42	V	6.4	10.6	21.64	30.0	-8.4																																																																																											
	3725.00	19.49	H	6.4	10.6	23.71	30.0	-6.3																																																																																											
	Mid Ch																																																																																																		
	3840.00	18.79	V	6.5	10.3	22.61	30.0	-7.4																																																																																											
	3840.00	20.08	H	6.5	10.3	23.90	30.0	-6.1																																																																																											
	High Ch																																																																																																		
	3955.00	17.77	V	6.6	10.2	21.41	30.0	-8.6																																																																																											
3955.00	19.63	H	6.6	10.2	23.26	30.0	-6.7																																																																																												
50MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4790270388 Date: 2/10/2022 Test Engineer: 25546 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_16QAM NR n77 UP Fundamentals, 50MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>3725.00</td><td>16.81</td><td>V</td><td>6.4</td><td>10.6</td><td>21.03</td><td>30.0</td><td>-9.0</td><td></td></tr><tr><td>3725.00</td><td>19.04</td><td>H</td><td>6.4</td><td>10.6</td><td>23.26</td><td>30.0</td><td>-6.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>3840.00</td><td>18.01</td><td>V</td><td>6.5</td><td>10.3</td><td>21.83</td><td>30.0</td><td>-8.2</td><td></td></tr><tr><td>3840.00</td><td>18.64</td><td>H</td><td>6.5</td><td>10.3</td><td>22.46</td><td>30.0</td><td>-7.5</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>3955.00</td><td>17.52</td><td>V</td><td>6.6</td><td>10.2</td><td>21.16</td><td>30.0</td><td>-8.8</td><td></td></tr><tr><td>3955.00</td><td>19.40</td><td>H</td><td>6.6</td><td>10.2</td><td>23.03</td><td>30.0</td><td>-7.0</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3725.00	16.81	V	6.4	10.6	21.03	30.0	-9.0		3725.00	19.04	H	6.4	10.6	23.26	30.0	-6.7		Mid Ch									3840.00	18.01	V	6.5	10.3	21.83	30.0	-8.2		3840.00	18.64	H	6.5	10.3	22.46	30.0	-7.5		High Ch									3955.00	17.52	V	6.6	10.2	21.16	30.0	-8.8		3955.00	19.40	H	6.6	10.2	23.03	30.0	-7.0	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	3725.00	16.81	V	6.4	10.6	21.03	30.0	-9.0																																																																																											
	3725.00	19.04	H	6.4	10.6	23.26	30.0	-6.7																																																																																											
	Mid Ch																																																																																																		
	3840.00	18.01	V	6.5	10.3	21.83	30.0	-8.2																																																																																											
	3840.00	18.64	H	6.5	10.3	22.46	30.0	-7.5																																																																																											
	High Ch																																																																																																		
	3955.00	17.52	V	6.6	10.2	21.16	30.0	-8.8																																																																																											
3955.00	19.40	H	6.6	10.2	23.03	30.0	-7.0																																																																																												

40MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/10/2022

25546

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 40MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3720.00	17.83	V	6.4	10.6	22.08	30.0	-7.9	
3720.00	19.88	H	6.4	10.6	24.12	30.0	-5.9	
Mid Ch								
3840.00	17.73	V	6.5	10.3	21.55	30.0	-8.5	
3840.00	19.58	H	6.5	10.3	23.40	30.0	-6.6	
High Ch								
3960.00	18.97	V	6.6	10.2	22.59	30.0	-7.4	
3960.00	19.87	H	6.6	10.2	23.50	30.0	-6.5	

40MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/10/2022

25546

EUT, Y-Position

Chamber 2

5G NR_16QAM NR n77 UP Fundamentals, 40MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3720.00	16.99	V	6.4	10.6	21.24	30.0	-8.8	
3720.00	18.98	H	6.4	10.6	23.22	30.0	-6.8	
Mid Ch								
3840.00	17.29	V	6.5	10.3	21.11	30.0	-8.9	
3840.00	18.80	H	6.5	10.3	22.62	30.0	-7.4	
High Ch								
3960.00	17.80	V	6.6	10.2	21.42	30.0	-8.6	
3960.00	18.79	H	6.6	10.2	22.42	30.0	-7.6	

30MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/16/2022

19227

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 30MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3715.00	18.69	V	6.4	10.7	22.96	30.0	-7.0	
3715.00	20.02	H	6.4	10.7	24.28	30.0	-5.7	
Mid Ch								
3840.00	19.24	V	6.5	10.3	23.06	30.0	-6.9	
3840.00	19.61	H	6.5	10.3	23.43	30.0	-6.6	
High Ch								
3965.00	18.17	V	6.6	10.2	21.79	30.0	-8.2	
3965.00	19.55	H	6.6	10.2	23.18	30.0	-6.8	

30MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/16/2022

19227

EUT, Y-Position

Chamber 2

5G NR_16QAM NR n77 UP Fundamentals, 30MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3715.00	18.04	V	6.4	10.7	22.31	30.0	-7.7	
3715.00	19.16	H	6.4	10.7	23.42	30.0	-6.6	
Mid Ch								
3840.00	18.00	V	6.5	10.3	21.82	30.0	-8.2	
3840.00	18.44	H	6.5	10.3	22.26	30.0	-7.7	
High Ch								
3965.00	17.21	V	6.6	10.2	20.83	30.0	-9.2	
3965.00	18.50	H	6.6	10.2	22.13	30.0	-7.9	

20MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/11/2022

19227

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 20MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3710.00	17.65	V	6.4	10.7	21.94	30.0	-8.1	
3710.00	19.79	H	6.4	10.7	24.08	30.0	-5.9	
Mid Ch								
3840.00	18.77	V	6.5	10.3	22.59	30.0	-7.4	
3840.00	19.97	H	6.5	10.3	23.79	30.0	-6.2	
High Ch								
3970.00	18.23	V	6.6	10.2	21.85	30.0	-8.1	
3970.00	19.60	H	6.6	10.2	23.23	30.0	-6.8	

20MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/11/2022

19227

EUT, Y-Position

Chamber 2

5G NR_16QAM NR n77 UP Fundamentals, 20MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3710.00	16.34	V	6.4	10.7	20.63	30.0	-9.4	
3710.00	18.42	H	6.4	10.7	22.71	30.0	-7.3	
Mid Ch								
3840.00	17.55	V	6.5	10.3	21.37	30.0	-8.6	
3840.00	18.67	H	6.5	10.3	22.49	30.0	-7.5	
High Ch								
3970.00	16.84	V	6.6	10.2	20.46	30.0	-9.5	
3970.00	18.37	H	6.6	10.2	22.00	30.0	-8.0	

15MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4790270388

Date:

2/16/2022

Test Engineer:

19227

Configuration:

EUT, Y-Position

Location:

Chamber 2

Mode:

5G NR_QPSK NR n77 UP Fundamentals, 15MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3707.50	18.41	V	6.4	10.7	22.70	30.0	-7.3	
3707.50	19.84	H	6.4	10.7	24.13	30.0	-5.9	
Mid Ch								
3840.00	19.00	V	6.5	10.3	22.82	30.0	-7.2	
3840.00	19.80	H	6.5	10.3	23.62	30.0	-6.4	
High Ch								
3972.50	18.11	V	6.6	10.2	21.73	30.0	-8.3	
3972.50	18.63	H	6.6	10.2	22.25	30.0	-7.7	

15MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4790270388

Date:

2/16/2022

Test Engineer:

19227

Configuration:

EUT, Y-Position

Location:

Chamber 2

Mode:

5G NR_16QAM NR n77 UP Fundamentals, 15MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3707.50	17.62	V	6.4	10.7	21.91	30.0	-8.1	
3707.50	19.05	H	6.4	10.7	23.34	30.0	-6.7	
Mid Ch								
3840.00	17.76	V	6.5	10.3	21.58	30.0	-8.4	
3840.00	18.49	H	6.5	10.3	22.31	30.0	-7.7	
High Ch								
3972.50	17.24	V	6.6	10.2	20.86	30.0	-9.1	
3972.50	18.23	H	6.6	10.2	21.85	30.0	-8.1	

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/16/2022

19227

EUT, Y-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3705.00	18.83	V	6.4	10.7	23.14	30.0	-6.9	
3705.00	19.90	H	6.4	10.7	24.21	30.0	-5.8	
Mid Ch								
3840.00	18.98	V	6.5	10.3	22.80	30.0	-7.2	
3840.00	19.65	H	6.5	10.3	23.47	30.0	-6.5	
High Ch								
3975.00	18.68	V	6.6	10.2	22.29	30.0	-7.7	
3975.00	19.53	H	6.6	10.2	23.15	30.0	-6.9	

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/16/2022

19227

EUT, Y-Position

Chamber 2

5G NR_16QAM NR n77 UP Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3705.00	17.87	V	6.4	10.7	22.18	30.0	-7.8	
3705.00	18.78	H	6.4	10.7	23.09	30.0	-6.9	
Mid Ch								
3840.00	17.88	V	6.5	10.3	21.70	30.0	-8.3	
3840.00	18.40	H	6.5	10.3	22.22	30.0	-7.8	
High Ch								
3975.00	17.16	V	6.6	10.2	20.77	30.0	-9.2	
3975.00	18.36	H	6.6	10.2	21.98	30.0	-8.0	

NR Band n77 (3700 ~ 3980 MHz, SRS1)

90MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/18/2022

19568

EUT, X-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 90MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3745.00	5.67	V	6.4	10.6	9.80	30.0	-20.2	
3745.00	8.98	H	6.4	10.6	13.11	30.0	-16.9	
Mid Ch								
3840.00	5.09	V	6.5	10.3	8.91	30.0	-21.1	
3840.00	9.00	H	6.5	10.3	12.82	30.0	-17.2	
High Ch								
3935.00	4.41	V	6.6	10.2	8.07	30.0	-21.9	
3935.00	8.74	H	6.6	10.2	12.39	30.0	-17.6	

NR Band n77 (3700 ~ 3980 MHz, SRS2)

100MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4790270388

2/18/2022

19568

EUT, Z-Position

Chamber 2

5G NR_QPSK NR n77 UP Fundamentals, 100MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00161451], 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								
3750.00	8.93	V	6.4	10.5	13.05	30.0	-16.9	
3750.00	11.34	H	6.4	10.5	15.46	30.0	-14.5	
Mid Ch								
3840.00	7.55	V	6.5	10.3	11.37	30.0	-18.6	
3840.00	11.27	H	6.5	10.3	15.09	30.0	-14.9	
High Ch								
3930.00	7.61	V	6.6	10.2	11.27	30.0	-18.7	
3930.00	9.68	H	6.6	10.2	13.34	30.0	-16.7	

NR Band n77 (3700 ~ 3980 MHz, SRS3)

70MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4790270388 Date: 2/18/2022 Test Engineer: 19227 Configuration: EUT, Z-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 UP Fundamentals, 70MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 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								
	3735.00	9.93	V	6.4	10.6	14.10	30.0	-15.9	
	3735.00	0.02	H	6.4	10.6	4.20	30.0	-25.8	
	Mid Ch								
	3840.00	10.14	V	6.5	10.3	13.96	30.0	-16.0	
	3840.00	1.47	H	6.5	10.3	5.29	30.0	-24.7	
High Ch									
3945.00	7.39	V	6.6	10.2	11.03	30.0	-19.0		
3945.00	-1.85	H	6.6	10.2	1.79	30.0	-28.2		

9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §24.238 and §27.53

LIMIT

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:

(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.

(l)(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

(n)(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

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) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points $\geq$ span/RBW;
- g) Trace mode = average(5G NR FDD), Maxhold(5G NR TDD);

RESULTS

See the following pages.

NOTE1

5G NR: All Waveforms (CP-OFDM vs DFT-s OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

NOTE2

Please refer to section 5.4 for bandwidth and RB setting about 5G NR bands.

9.6.1. SPURIOUS RADIATION PLOTS

NR Band n25

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790270388							
Date:		1/28/2022							
Test Engineer:		19227							
Configuration:		EUT, X-Position							
Location:		Chamber 1							
Mode:		5G NR_QPSK NR n25 Harmonics, 10MHz 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, 1855MHz									
3710.00	-6.7	V	3.0	45.8	1.0	-51.5	-13.0	-38.5	
5565.00	-5.1	V	3.0	45.7	1.0	-49.8	-13.0	-36.8	
7420.00	-1.1	V	3.0	44.5	1.0	-44.6	-13.0	-31.6	
3710.00	-6.7	H	3.0	45.8	1.0	-51.6	-13.0	-38.6	
5565.00	-5.1	H	3.0	45.7	1.0	-49.8	-13.0	-36.8	
7420.00	-1.2	H	3.0	44.5	1.0	-44.8	-13.0	-31.8	
Mid Ch, 1882.5MHz									
3765.00	-6.7	V	3.0	45.8	1.0	-51.5	-13.0	-38.5	
5647.50	-4.6	V	3.0	45.7	1.0	-49.4	-13.0	-36.4	
7530.00	-0.9	V	3.0	44.5	1.0	-44.4	-13.0	-31.4	
3765.00	-6.6	H	3.0	45.8	1.0	-51.4	-13.0	-38.4	
5647.50	-4.6	H	3.0	45.7	1.0	-49.4	-13.0	-36.4	
7530.00	-0.9	H	3.0	44.5	1.0	-44.4	-13.0	-31.4	
High Ch, 1910MHz									
3820.00	-6.7	V	3.0	45.8	1.0	-51.5	-13.0	-38.5	
5730.00	-4.8	V	3.0	45.7	1.0	-49.5	-13.0	-36.5	
7640.00	-0.6	V	3.0	44.4	1.0	-44.1	-13.0	-31.1	
3820.00	-6.5	H	3.0	45.8	1.0	-51.4	-13.0	-38.4	
5730.00	-4.9	H	3.0	45.7	1.0	-49.6	-13.0	-36.6	
7640.00	-0.7	H	3.0	44.4	1.0	-44.1	-13.0	-31.1	

NR Band n41

	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4790270388 Date: 2/9/2022 Test Engineer: 19568 Configuration: EUT, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n41 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
10MHz QPSK	Low Ch, 2501.01MHz									
	5002.02	-4.4	V	3.0	43.0	1.0	-46.5	-25.0	-21.5	
	7503.03	-5.4	V	3.0	42.7	1.0	-47.1	-25.0	-22.1	
	10004.04	-10.7	V	3.0	41.1	1.0	-50.8	-25.0	-25.8	
	5002.02	-1.4	H	3.0	43.0	1.0	-43.5	-25.0	-18.5	
	7503.03	-5.7	H	3.0	42.7	1.0	-47.3	-25.0	-22.3	
	10004.04	-11.4	H	3.0	41.1	1.0	-51.5	-25.0	-26.5	
	Mid Ch, 2592.99MHz									
	5185.98	-7.3	V	3.0	43.1	1.0	-49.4	-25.0	-24.4	
	7778.97	-12.1	V	3.0	42.5	1.0	-53.7	-25.0	-28.7	
	10371.96	-13.2	V	3.0	41.3	1.0	-53.5	-25.0	-28.5	
	5185.98	-4.6	H	3.0	43.1	1.0	-46.6	-25.0	-21.6	
	7778.97	-13.9	H	3.0	42.5	1.0	-55.5	-25.0	-30.5	
	10371.96	-12.4	H	3.0	41.3	1.0	-52.6	-25.0	-27.6	
	High Ch, 2685MHz									
	5370.00	-14.1	V	3.0	43.1	1.0	-56.2	-25.0	-31.2	
	8055.00	-12.3	V	3.0	42.4	1.0	-53.7	-25.0	-28.7	
	10740.00	-11.3	V	3.0	41.4	1.0	-51.8	-25.0	-26.8	
	5370.00	-13.4	H	3.0	43.1	1.0	-55.5	-25.0	-30.5	
	8055.00	-14.5	H	3.0	42.4	1.0	-55.9	-25.0	-30.9	
	10740.00	-10.8	H	3.0	41.4	1.0	-51.2	-25.0	-26.2	

NR Band n41 (SRS1)

	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4790270388 Date: 2/18/2022 Test Engineer: 19227 Configuration: EUT / AC Adapter, X-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n41 Harmonics, 100MHz 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
100MHz QPSK	Low Ch, 2546.01MHz									
	5092.02	-18.5	V	3.0	43.0	1.0	-60.5	-25.0	-35.5	
	7638.03	-16.9	V	3.0	42.6	1.0	-58.6	-25.0	-33.6	
	10184.04	-13.7	V	3.0	41.2	1.0	-53.8	-25.0	-28.8	
	5092.02	-18.5	H	3.0	43.0	1.0	-60.5	-25.0	-35.5	
	7638.03	-16.7	H	3.0	42.6	1.0	-58.3	-25.0	-33.3	
	10184.04	-13.4	H	3.0	41.2	1.0	-53.6	-25.0	-28.6	
	Mid Ch, 2592.99MHz									
	5185.98	-18.5	V	3.0	43.1	1.0	-60.6	-25.0	-35.6	
	7778.97	-16.2	V	3.0	42.5	1.0	-57.7	-25.0	-32.7	
	10371.96	-13.4	V	3.0	41.3	1.0	-53.6	-25.0	-28.6	
	5185.98	-18.2	H	3.0	43.1	1.0	-60.3	-25.0	-35.3	
	7778.97	-16.9	H	3.0	42.5	1.0	-58.5	-25.0	-33.5	
	10371.96	-13.3	H	3.0	41.3	1.0	-53.6	-25.0	-28.6	
	High Ch, 2640MHz									
	5280.00	-17.9	V	3.0	43.1	1.0	-60.0	-25.0	-35.0	
	7920.00	-16.2	V	3.0	42.5	1.0	-57.7	-25.0	-32.7	
	10560.00	-13.0	V	3.0	41.3	1.0	-53.3	-25.0	-28.3	
	5280.00	-17.9	H	3.0	43.1	1.0	-60.0	-25.0	-35.0	
	7920.00	-16.6	H	3.0	42.5	1.0	-58.1	-25.0	-33.1	
	10560.00	-12.5	H	3.0	41.3	1.0	-52.8	-25.0	-27.8	

NR Band n77 (3450 – 3550 MHz)

	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4790270388 Date: 2/11/2022 Test Engineer: 25546 Configuration: EUT / AC Adapter, Y-Position Location: Chamber 2 Mode: 5G NR_QPSK NR n77 LO Harmonics, 60MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
60MHz QPSK	Low Ch, 3480MHz									
	6960.00	6.5	V	3.0	42.9	1.0	-35.5	-13.0	-22.5	
	10440.00	0.9	V	3.0	41.3	1.0	-39.4	-13.0	-26.4	
	13920.00	7.4	V	3.0	43.2	1.0	-34.8	-13.0	-21.8	
	6960.00	2.1	H	3.0	42.9	1.0	-39.8	-13.0	-26.8	
	10440.00	0.9	H	3.0	41.3	1.0	-39.4	-13.0	-26.4	
	13920.00	7.0	H	3.0	43.2	1.0	-35.2	-13.0	-22.2	
	Mid Ch, 3499.98MHz									
	6999.96	6.8	V	3.0	42.9	1.0	-35.2	-13.0	-22.2	
	10499.94	1.4	V	3.0	41.3	1.0	-38.9	-13.0	-25.9	
	13999.92	6.9	V	3.0	43.3	1.0	-35.4	-13.0	-22.4	
	6999.96	0.6	H	3.0	42.9	1.0	-41.4	-13.0	-28.4	
	10499.94	1.4	H	3.0	41.3	1.0	-38.9	-13.0	-25.9	
	13999.92	7.4	H	3.0	43.3	1.0	-34.9	-13.0	-21.9	
	High Ch, 3519MHz									
	7038.00	8.0	V	3.0	42.9	1.0	-33.9	-13.0	-20.9	
	10557.00	1.6	V	3.0	41.3	1.0	-38.7	-13.0	-25.7	
	14076.00	7.5	V	3.0	43.3	1.0	-34.9	-13.0	-21.9	
	7038.00	2.2	H	3.0	42.9	1.0	-39.7	-13.0	-26.7	
	10557.00	1.9	H	3.0	41.3	1.0	-38.5	-13.0	-25.5	
	14076.00	7.6	H	3.0	43.3	1.0	-34.7	-13.0	-21.7	