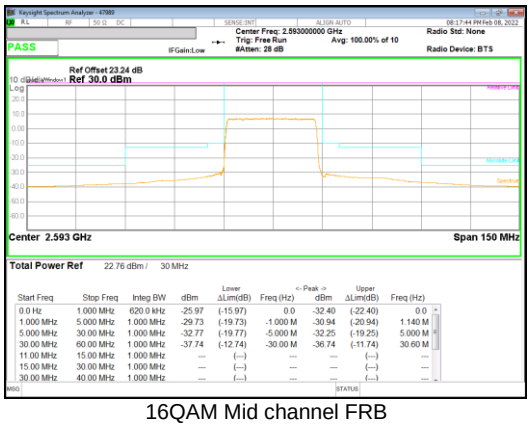
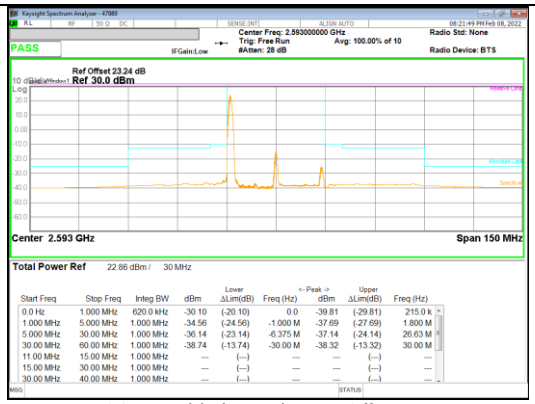
30MHz

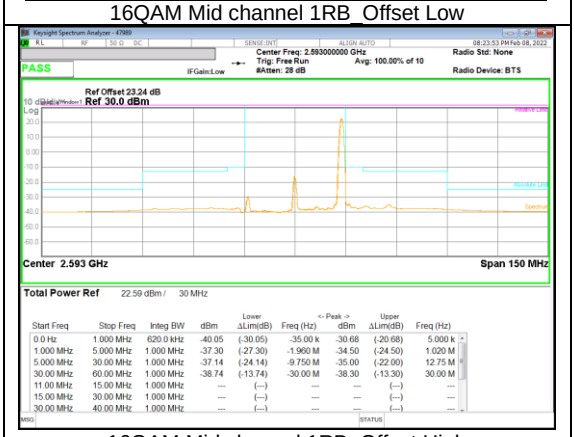
16QAM



16QAM Mid channel FRB

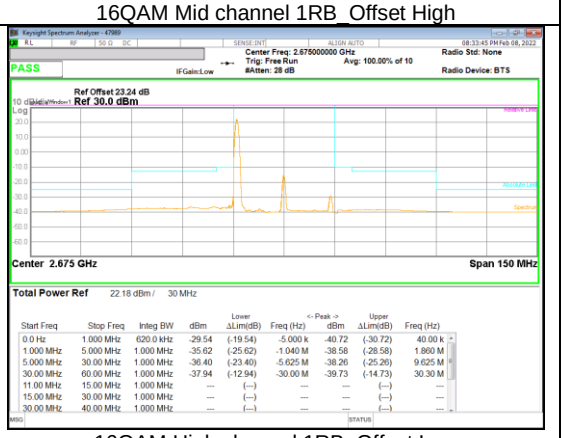


16QAM Mid channel 1RB_Offset Low

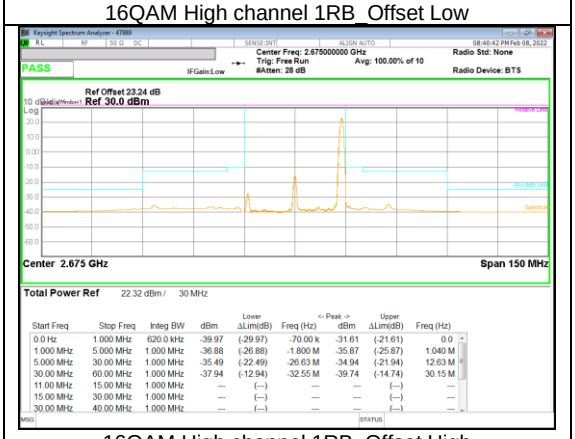


16QAM Mid channel 1RB_Offset High

16QAM High channel FRB



16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

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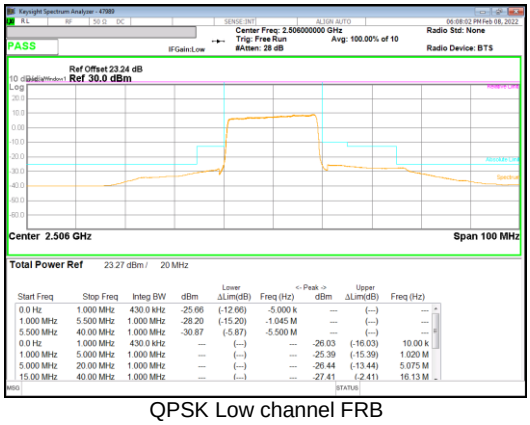
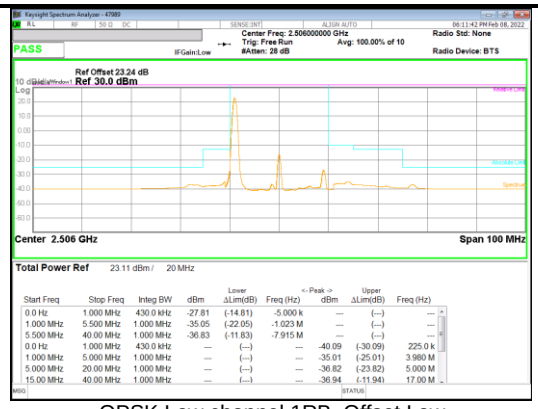
20MHz

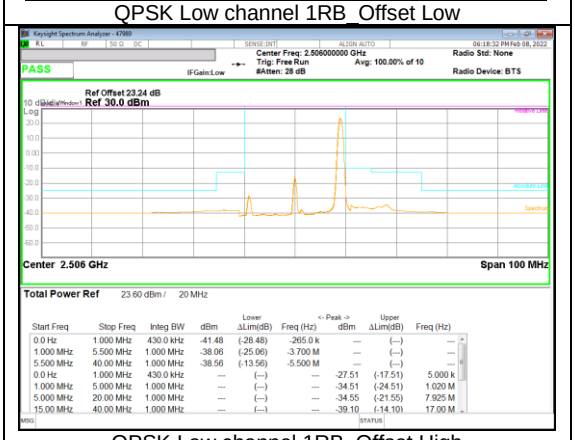
QPSK



QPSK Low channel FRB

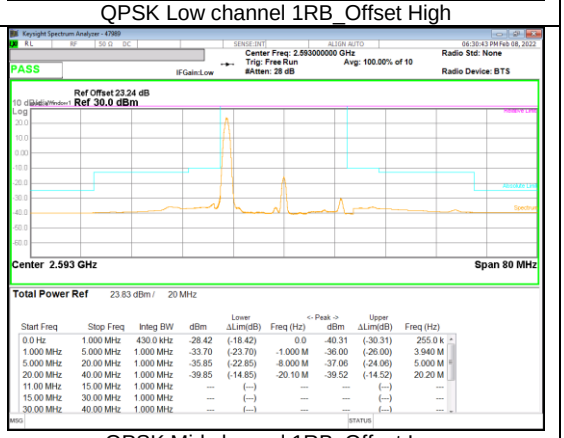


QPSK Low channel 1RB_Offset Low



QPSK Low channel 1RB_Offset High

QPSK Mid channel FRB



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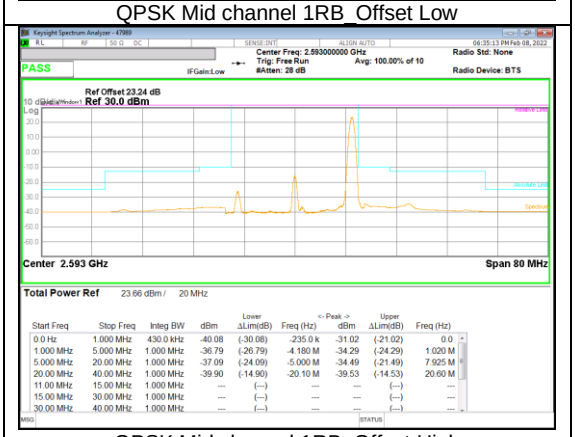

QPSK Mid channel 1RB_Offset High

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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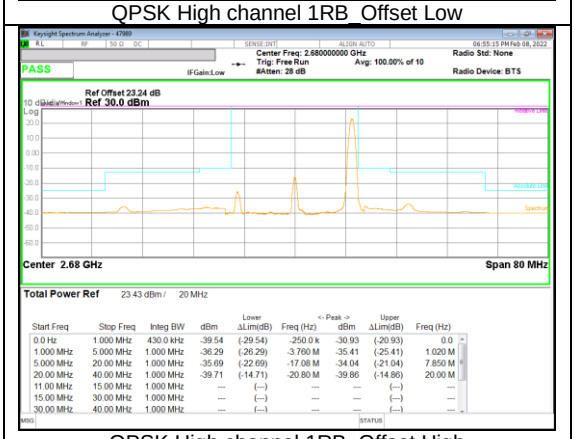
20MHz

QPSK

QPSK High channel FRB

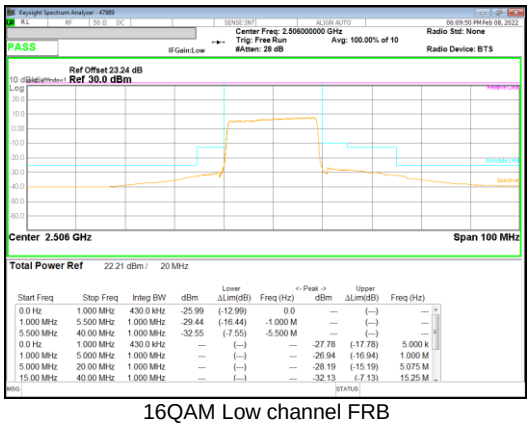
QPSK High channel 1RB_Offset Low



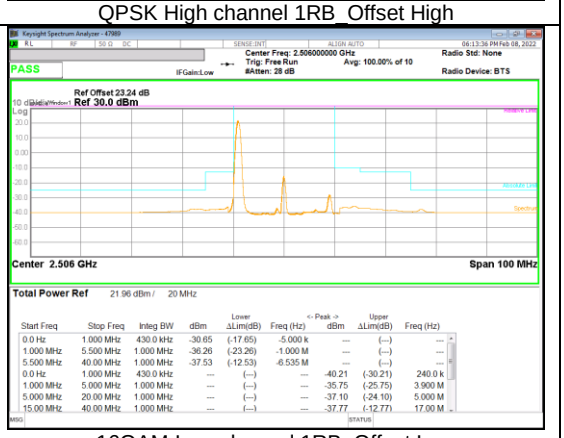
QPSK High channel 1RB_Offset High

20MHz

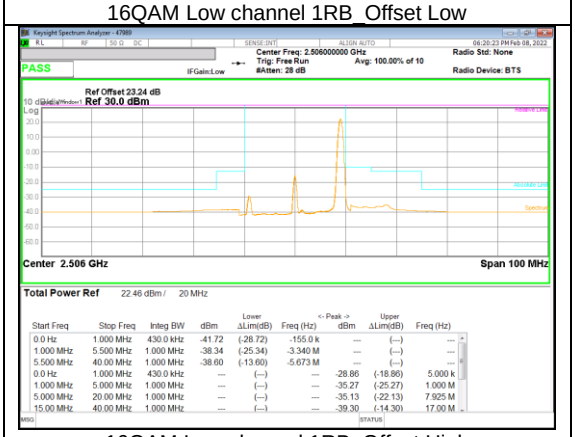
16QAM



16QAM Low channel FRB



16QAM Low channel 1RB_Offset Low



16QAM Low channel 1RB_Offset High

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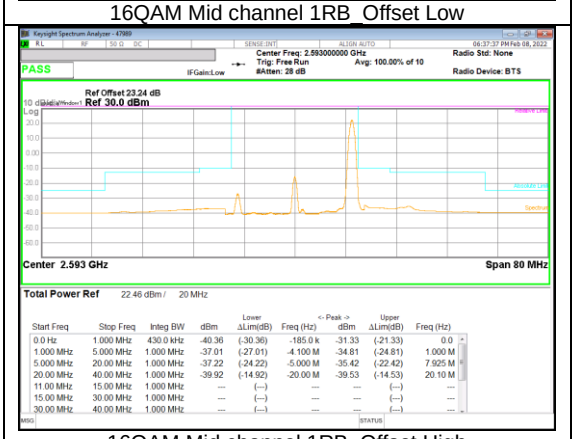
20MHz

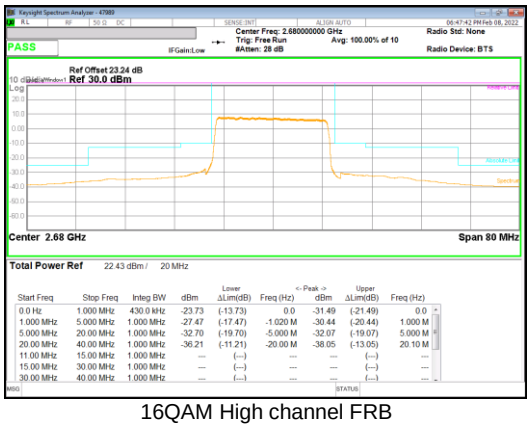
16QAM

16QAM Mid channel FRB

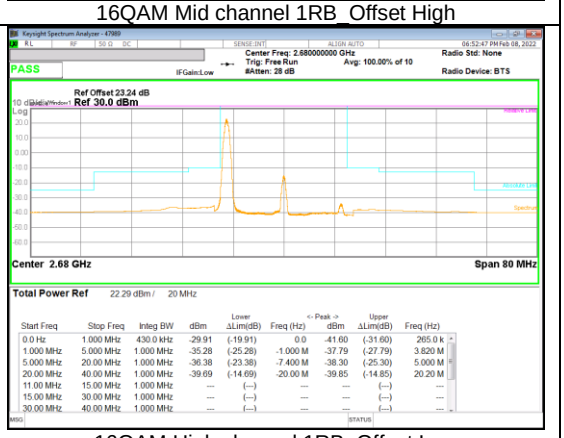
16QAM Mid channel 1RB_Offset Low



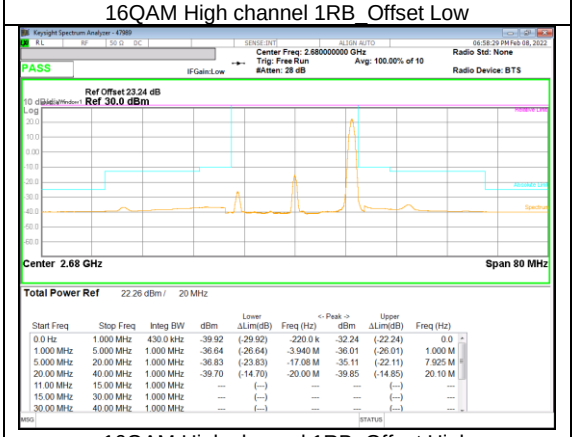
16QAM Mid channel 1RB_Offset High



16QAM High channel FRB



16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

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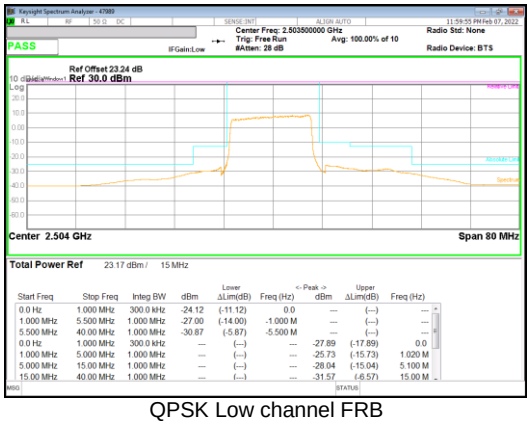
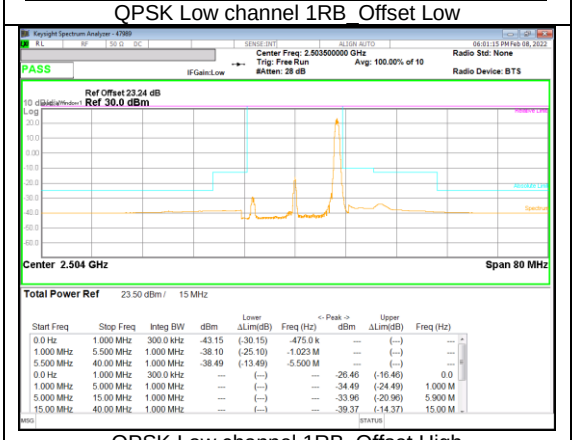
15MHz

QPSK

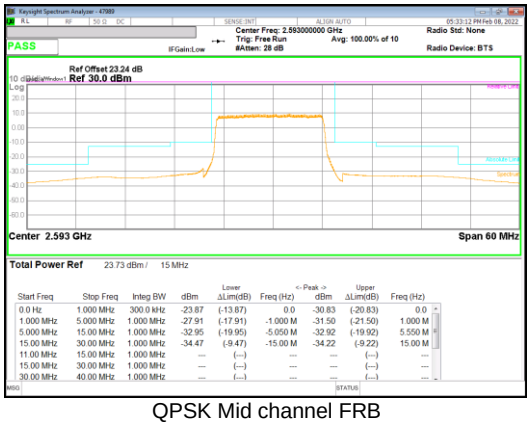


QPSK Low channel FRB

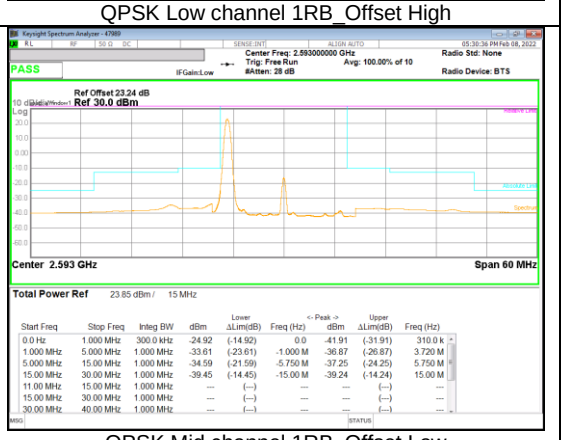
QPSK Low channel 1RB_Offset Low



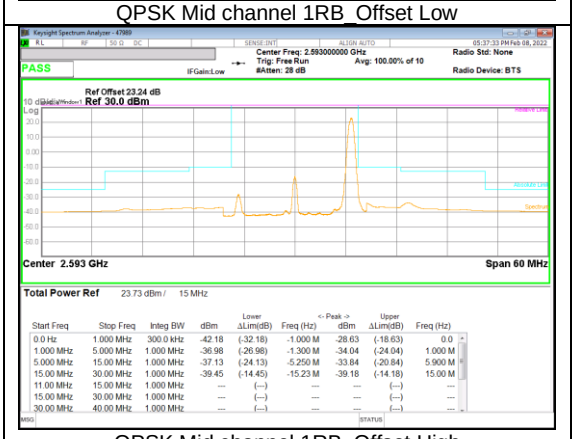
QPSK Low channel 1RB_Offset High



QPSK Mid channel FRB



QPSK Mid channel 1RB_Offset Low



QPSK Mid channel 1RB_Offset High

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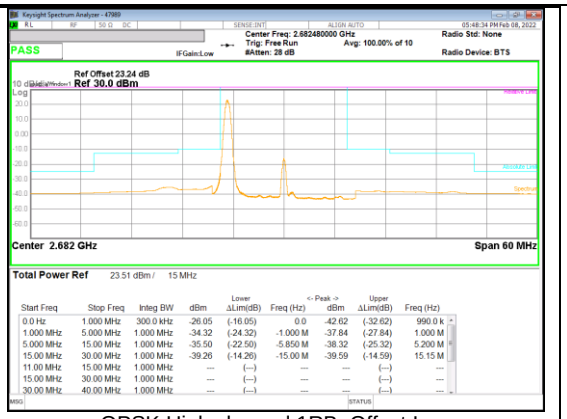
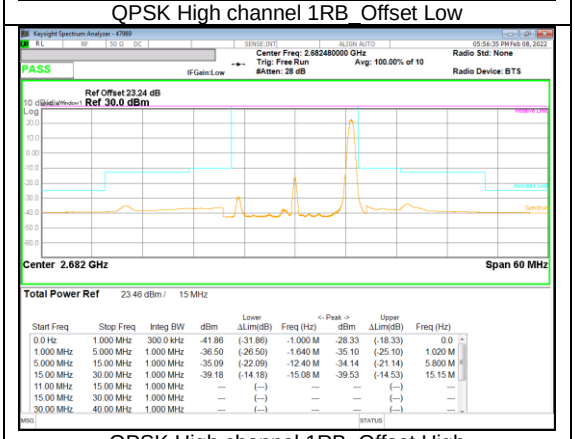
15MHz

QPSK

QPSK High channel FRB



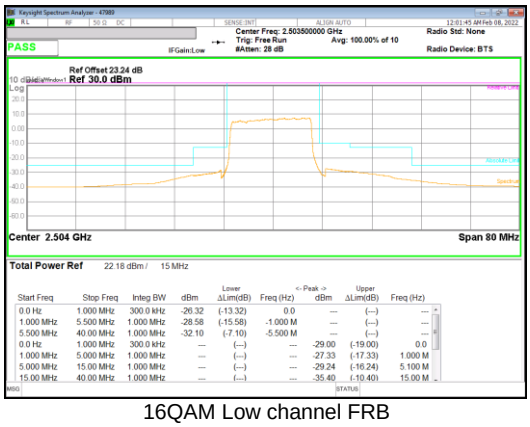
QPSK High channel 1RB_Offset Low



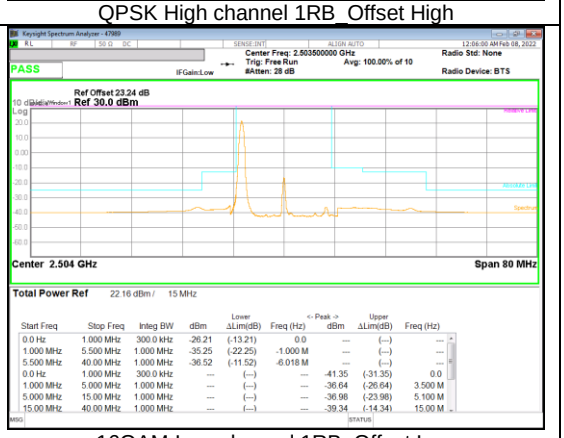
QPSK High channel 1RB_Offset High

15MHz

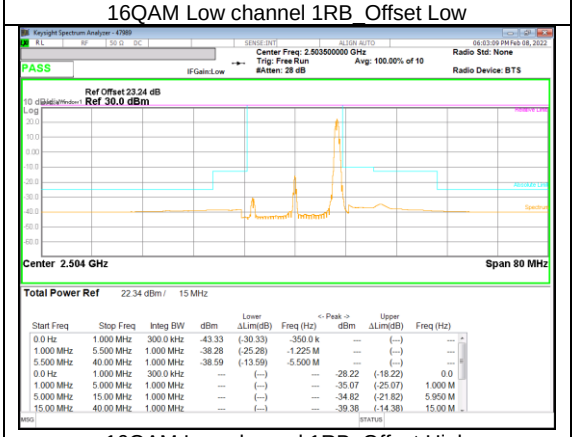
16QAM



16QAM Low channel FRB



16QAM Low channel 1RB_Offset Low



16QAM Low channel 1RB_Offset High

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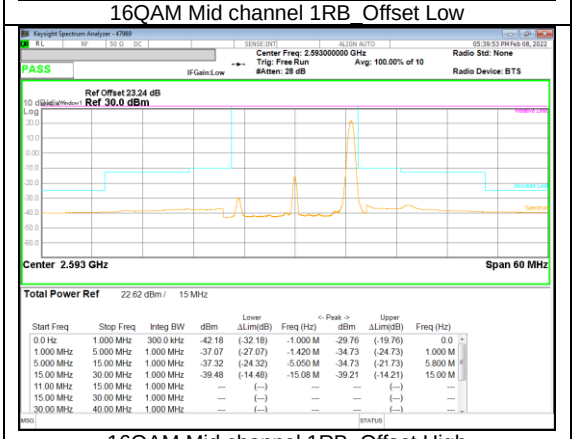
15MHz

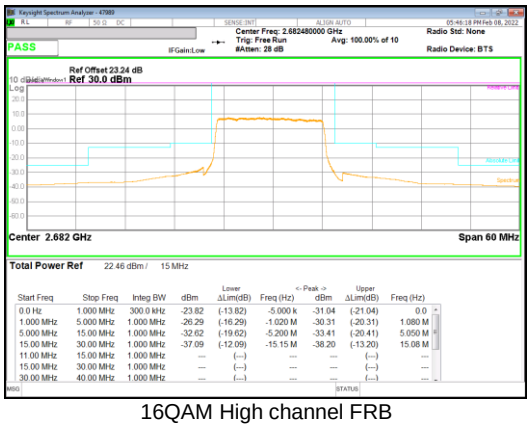
16QAM

16QAM Mid channel FRB

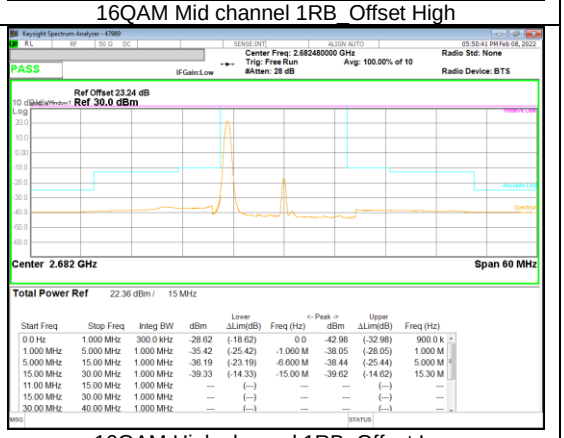
16QAM Mid channel 1RB_Offset Low



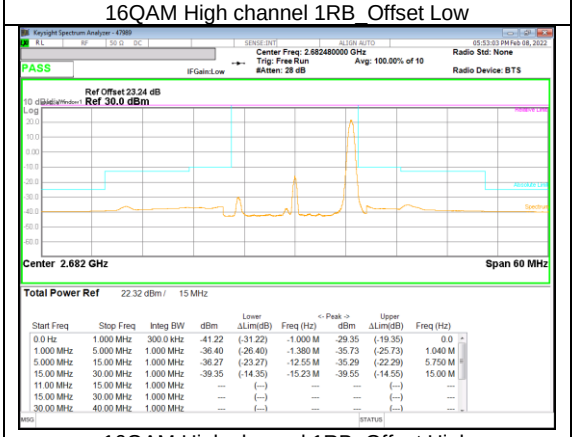
16QAM Mid channel 1RB_Offset High



16QAM High channel FRB



16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

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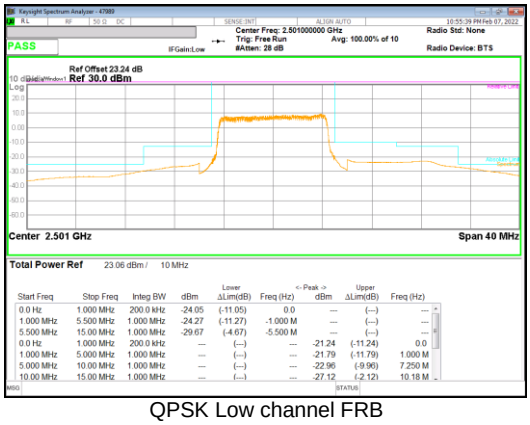
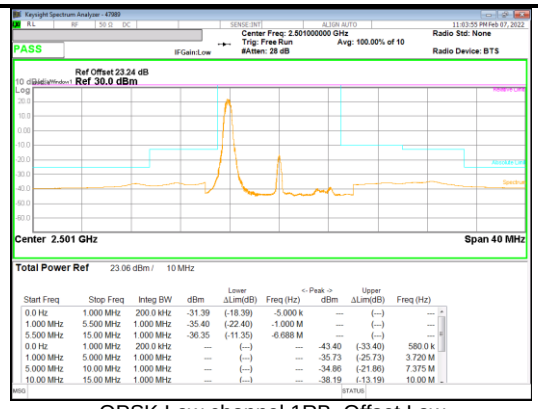
10MHz

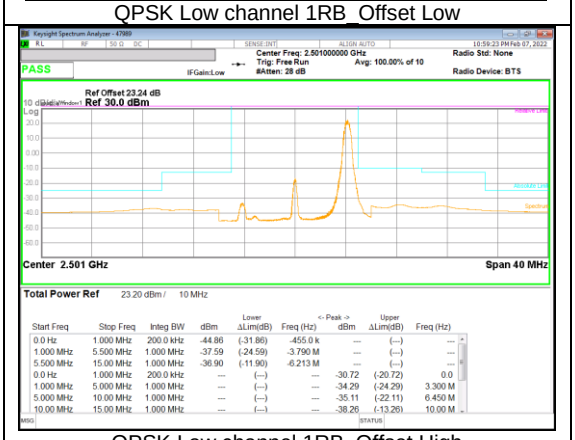
QPSK



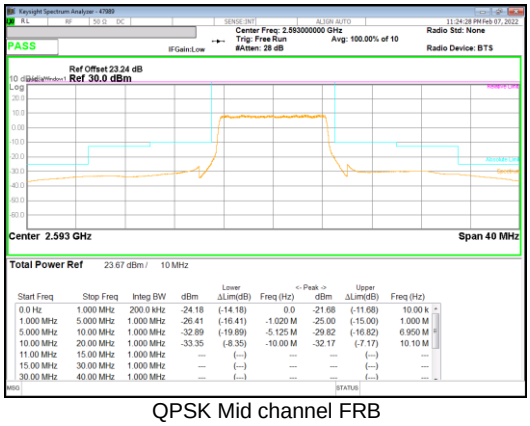
QPSK Low channel FRB



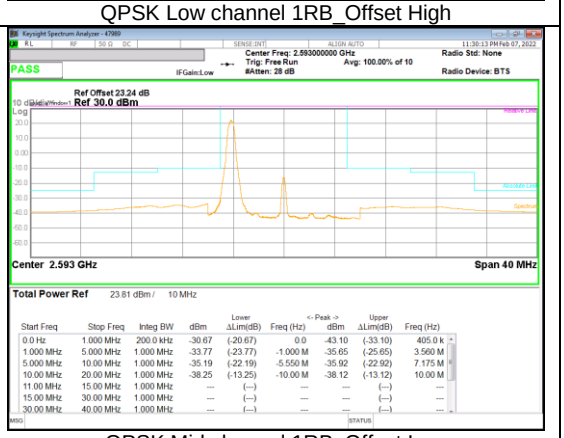
QPSK Low channel 1RB_Offset Low



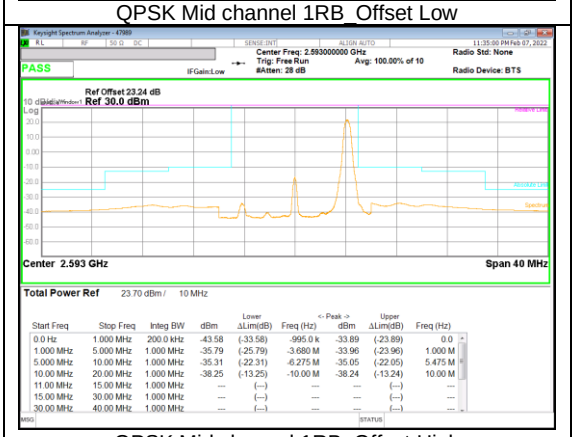
QPSK Low channel 1RB_Offset High



QPSK Mid channel FRB



QPSK Mid channel 1RB_Offset Low



QPSK Mid channel 1RB_Offset High

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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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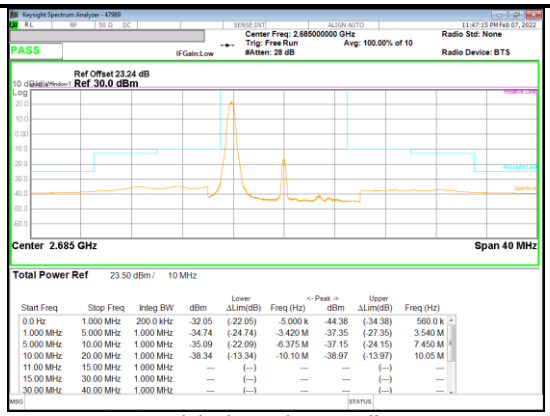
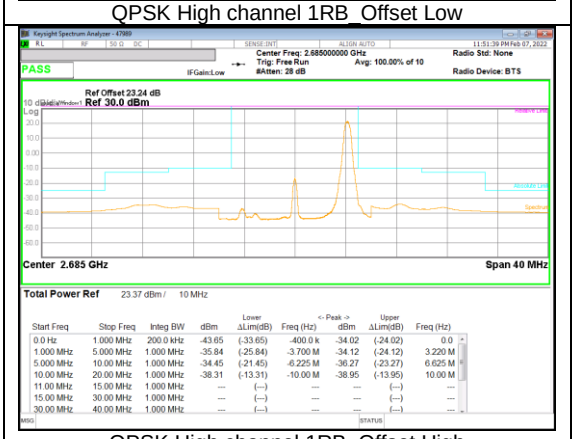
10MHz

QPSK

QPSK High channel FRB



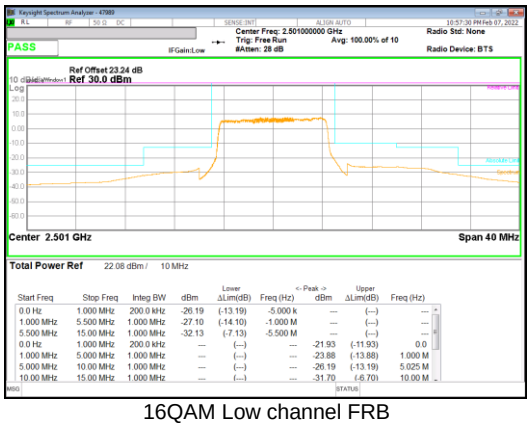
QPSK High channel 1RB_Offset Low



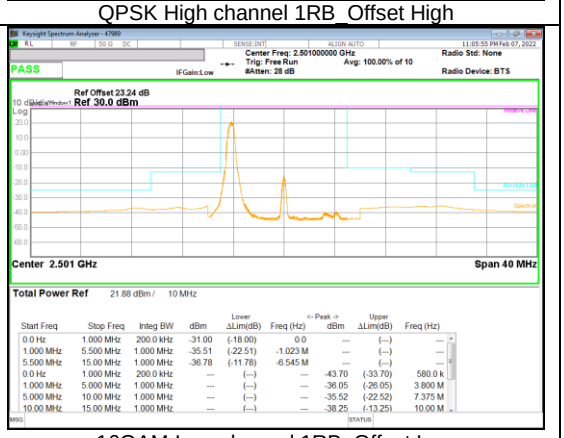
QPSK High channel 1RB_Offset High

10MHz

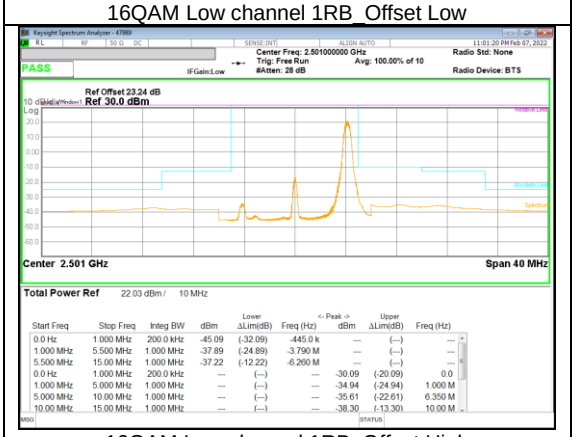
16QAM



16QAM Low channel FRB



16QAM Low channel 1RB_Offset Low



16QAM Low channel 1RB_Offset High

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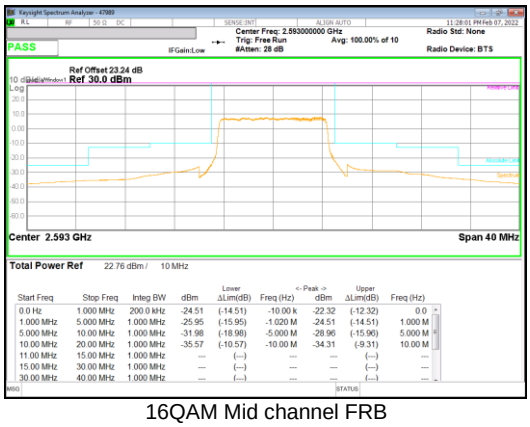
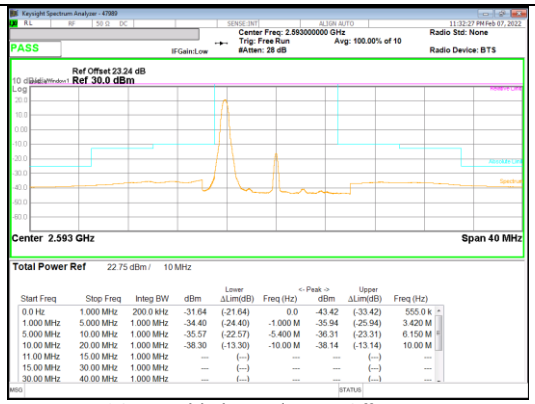
10MHz

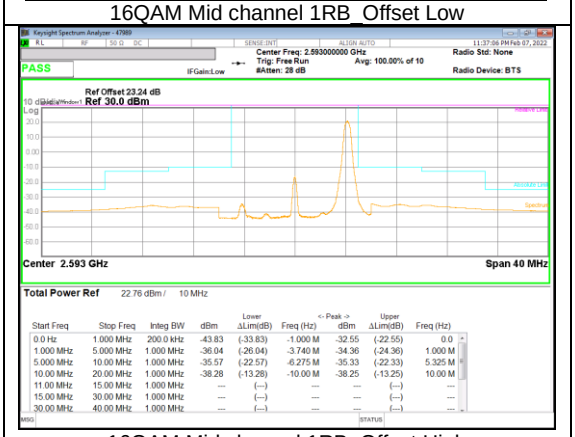
16QAM



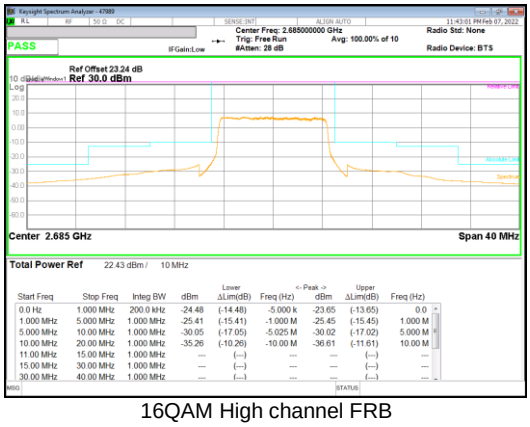
16QAM Mid channel FRB



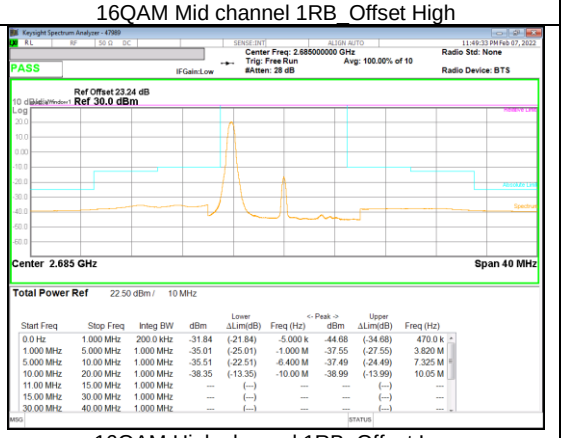
16QAM Mid channel 1RB_Offset Low



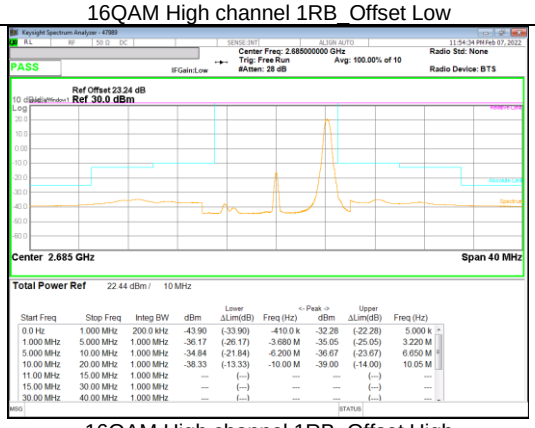
16QAM Mid channel 1RB_Offset High



16QAM High channel FRB



16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

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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 that 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.

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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 ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = auto couple;
e) Detector = rms;
f) Ensure that the number of measurement points = 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 (π/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.

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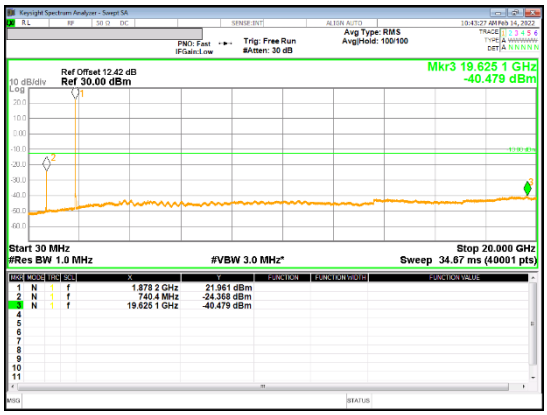
9.3.1. OUT OF BAND EMISSIONS RESULT

NR Band n25

10MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

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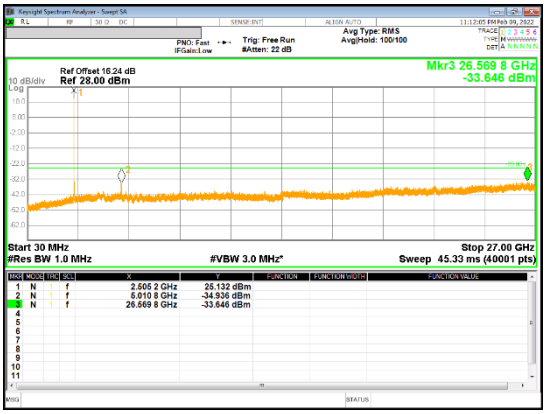
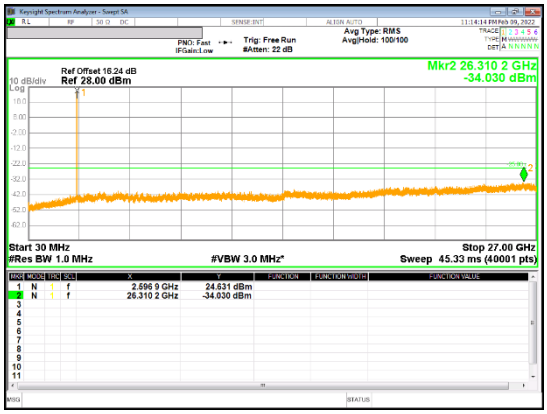
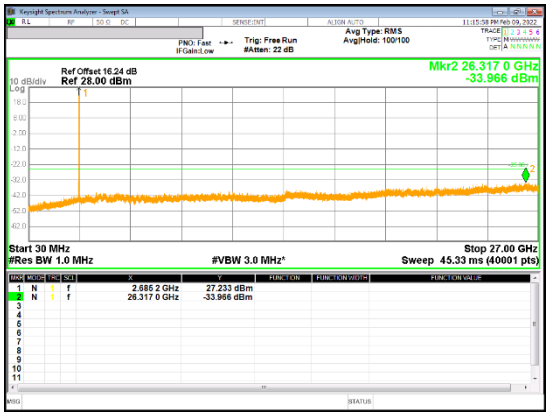
NR Band n41

10MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

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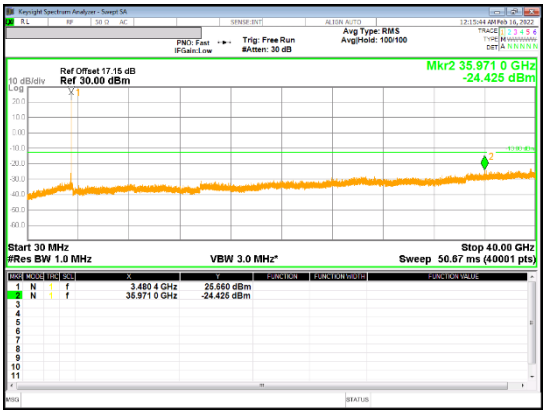
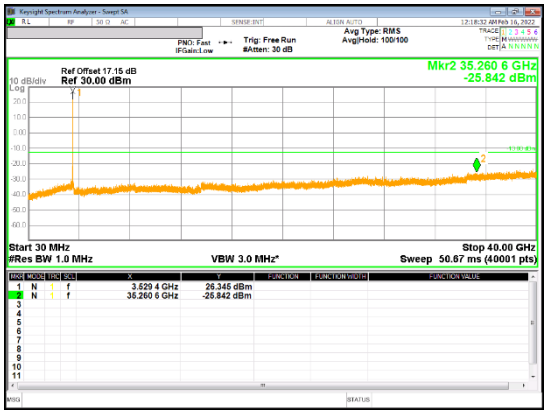
NR Band n77 (3450 – 3550 MHz)

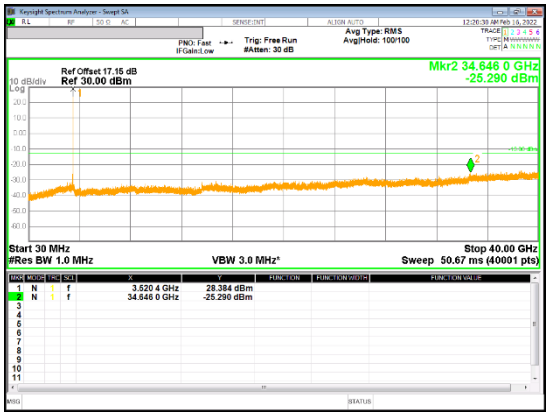
60MHz



QPSK Low channel



QPSK Mid channel



QPSK High channel

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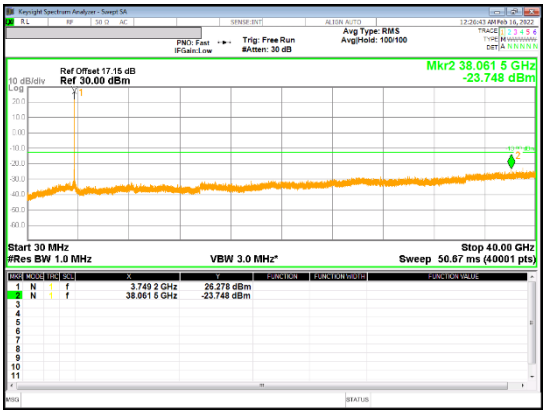
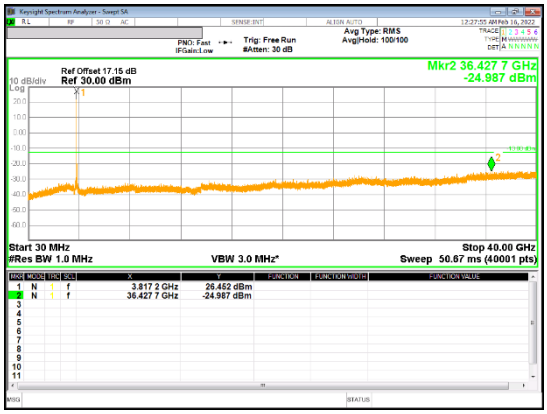
NR Band n77 (3700 – 3980 MHz)

50MHz



QPSK Low channel



QPSK Mid channel

QPSK High channel

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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)

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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

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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

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

TEST RESULTS

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9.5.1. ERP/EIRP Results

NR Band n25

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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NR Band n41

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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NR Band n41 (SRS1)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n41 (SRS2)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n41 (SRS3)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n77(3450 ~ 3550 MHz)

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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NR Band n77(3450 ~ 3550 MHz, SRS1)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n77(3450 ~ 3550 MHz, SRS2)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n77(3450 ~ 3550 MHz, SRS3)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n77(3700 ~ 3980 MHz)

Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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Band	BW [MHz]	Modulation	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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

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NR Band n77(3700 ~ 3980 MHz, SRS1)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n77(3700 ~ 3980 MHz, SRS2)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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NR Band n77(3700 ~ 3980 MHz, SRS3)

Band	BW [MHz]	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [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		

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9.5.2. ERP/EIRP DATA

NR Band n25

20MHz

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, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	12.44	V	4.5	9.5	17.49	33.0	-15.5	
1860.00	17.63	H	4.5	9.5	22.67	33.0	-10.3	
Mid Ch								
1882.50	12.63	V	4.5	9.4	17.49	33.0	-15.5	
1882.50	18.49	H	4.5	9.4	23.35	33.0	-9.7	
High Ch								
1905.00	13.23	V	4.5	9.2	17.88	33.0	-15.1	
1905.00	18.77	H	4.5	9.2	23.42	33.0	-9.6	

20MHz

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, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	11.49	V	4.5	9.5	16.54	33.0	-16.5	
1860.00	16.69	H	4.5	9.5	21.74	33.0	-11.3	
Mid Ch								
1882.50	11.82	V	4.5	9.4	16.68	33.0	-16.3	
1882.50	17.15	H	4.5	9.4	22.01	33.0	-11.0	
High Ch								
1905.00	13.23	V	4.5	9.2	17.88	33.0	-15.1	
1905.00	17.71	H	4.5	9.2	22.36	33.0	-10.6	

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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 Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
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	

15MHz

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, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	11.05	V	4.5	9.5	16.12	33.0	-16.9	
1857.50	16.60	H	4.5	9.5	21.67	33.0	-11.3	
Mid Ch								
1882.50	11.97	V	4.5	9.4	16.83	33.0	-16.2	
1882.50	17.03	H	4.5	9.4	21.89	33.0	-11.1	
High Ch								
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	

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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

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

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	

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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

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

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	

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NR Band n41

100MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790270388
Date: 2/17/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/17/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 100MHz Bandwidth

Test Equpment:
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	

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90MHz

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, 90MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/9/2022
Test Engineer: 19227
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 90MHz Bandwidth

Test Equpment:
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	

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80MHz

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, 80MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/9/2022
Test Engineer: 19227
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 80MHz Bandwidth

Test Equpment:
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	

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60MHz

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, 60MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/8/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 60MHz Bandwidth

Test Equpment:
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	

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50MHz

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, 50MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/8/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 50MHz Bandwidth

Test Equpment:
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	

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40MHz

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, 40MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/9/2022
Test Engineer: 19227
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 40MHz Bandwidth

Test Equpment:
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	

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30MHz

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, 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: Samsung
Project #: 4790270388
Date: 2/8/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 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	

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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 Equpment:
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 Equpment:
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	

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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

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

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	

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10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790270388
Date: 2/9/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n41 Fundamentals, 10MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/9/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n41 Fundamentals, 10MHz Bandwidth

Test Equpment:
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	

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NR Band n41 (SRS1)

100MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790270388
Date: 2/18/2022
Test Engineer: 19227
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/18/2022
Test Engineer: 19227
Configuration: EUT, Y-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n41 Fundamentals, 100MHz Bandwidth

Test Equpment:
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	

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NR Band n41 (SRS3)

100MHz

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 n41 Fundamentals, 100MHz Bandwidth

Test Equpment:
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	

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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 Equpment:
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
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 Equpment:
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
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	

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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

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

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	

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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 Equpment:
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								
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	

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 Equpment:
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								
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	

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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 Equpment:
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								
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 Equpment:
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								
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	

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60MHz

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, 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: 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, 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	

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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

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

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	

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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

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

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	

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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

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

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	

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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

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	

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

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	

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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

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

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	

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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

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	

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

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	

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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 Equpment:
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
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 Equpment:
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
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	

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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 Equpment:
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
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	

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NR Band n77 (3700 ~ 3980 MHz)

100MHz

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, 100MHz Bandwidth

Test Equpment:
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: 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, 100MHz Bandwidth

Test Equpment:
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	

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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 Equpment:
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	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	

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 Equpment:
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	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	

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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 Equpment:
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								
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	

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 Equpment:
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								
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	

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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 Equpment:
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	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	

70MHz

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, 70MHz Bandwidth

Test Equpment:
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	17.86	V	6.4	10.6	22.03	30.0	-8.0	
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	

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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	

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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 Equpment:
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								
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 Equpment:
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								
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	

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40MHz

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, 40MHz Bandwidth

Test Equpment:
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: 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, 40MHz Bandwidth

Test Equpment:
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	

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30MHz

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, 30MHz Bandwidth

Test Equpment:
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: 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, 30MHz Bandwidth

Test Equpment:
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	

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20MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790270388
Date: 2/11/2022
Test Engineer: 19227
Configuration: EUT, Y-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n77 UP Fundamentals, 20MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/11/2022
Test Engineer: 19227
Configuration: EUT, Y-Position
Location: Chamber 2
Mode: 5G NR_16QAM NR n77 UP Fundamentals, 20MHz Bandwidth

Test Equpment:
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	

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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	

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10MHz

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, 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: 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, 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	

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NR Band n77 (3700 ~ 3980 MHz, SRS1)

90MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790270388
Date: 2/18/2022
Test Engineer: 19568
Configuration: EUT, X-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n77 UP Fundamentals, 90MHz Bandwidth

Test Equpment:
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: Samsung
Project #: 4790270388
Date: 2/18/2022
Test Engineer: 19568
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: 5G NR_QPSK NR n77 UP Fundamentals, 100MHz Bandwidth

Test Equpment:
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	

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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 Equpment:
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	

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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 that 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.

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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 ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = auto couple;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = average(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 (π/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.

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9.6.1. SPURIOUS RADIATION PLOTS

NR Band n25

10MHz

QPSK

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 Votage:	AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 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	

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NR Band n41

10MHz

QPSK

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
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	

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NR Band n41 (SRS1)

100MHz

QPSK

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
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	

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NR Band n41 (SRS2)

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, Y-Position
Location:	Chamber 2
Mode:	5G NR_QPSK NR n41 Harmonics, 100MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

100MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2546.01MHz									
5092.02	-18.5	V	3.0	43.0	1.0	-60.5	-25.0	-35.5	
7638.03	-17.0	V	3.0	42.6	1.0	-58.6	-25.0	-33.6	
10184.04	-13.6	V	3.0	41.2	1.0	-53.8	-25.0	-28.8	
5092.02	-18.3	H	3.0	43.0	1.0	-60.3	-25.0	-35.3	
7638.03	-17.0	H	3.0	42.6	1.0	-58.6	-25.0	-33.6	
10184.04	-13.6	H	3.0	41.2	1.0	-53.8	-25.0	-28.8	
Mid Ch, 2592.99MHz									
5185.98	-18.4	V	3.0	43.1	1.0	-60.4	-25.0	-35.4	
7778.97	-17.1	V	3.0	42.5	1.0	-58.7	-25.0	-33.7	
10371.96	-13.3	V	3.0	41.3	1.0	-53.5	-25.0	-28.5	
5185.98	-18.2	H	3.0	43.1	1.0	-60.3	-25.0	-35.3	
7778.97	-17.1	H	3.0	42.5	1.0	-58.7	-25.0	-33.7	
10371.96	-13.7	H	3.0	41.3	1.0	-53.9	-25.0	-28.9	
High Ch, 2640MHz									
5280.00	-18.0	V	3.0	43.1	1.0	-60.1	-25.0	-35.1	
7920.00	-16.8	V	3.0	42.5	1.0	-58.3	-25.0	-33.3	
10560.00	-12.9	V	3.0	41.3	1.0	-53.2	-25.0	-28.2	
5280.00	-18.3	H	3.0	43.1	1.0	-60.4	-25.0	-35.4	
7920.00	-16.9	H	3.0	42.5	1.0	-58.3	-25.0	-33.3	
10560.00	-12.7	H	3.0	41.3	1.0	-53.1	-25.0	-28.1	

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NR Band n41 (SRS3)

100MHz

QPSK

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

Company:	Samsung
Project #:	4790270388
Date:	2/19/2022
Test Engineer:	19227
Configuration:	EUT / AC Adapter, Z-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
Low Ch, 2546.01MHz									
5092.02	-19.0	V	3.0	43.0	1.0	-61.0	-25.0	-36.0	
7638.03	-17.1	V	3.0	42.6	1.0	-58.7	-25.0	-33.7	
10184.04	-13.5	V	3.0	41.2	1.0	-53.7	-25.0	-28.7	
5092.02	-18.6	H	3.0	43.0	1.0	-60.7	-25.0	-35.7	
7638.03	-17.0	H	3.0	42.6	1.0	-58.6	-25.0	-33.6	
10184.04	-13.5	H	3.0	41.2	1.0	-53.6	-25.0	-28.6	
Mid Ch, 2592.99MHz									
5185.98	-18.6	V	3.0	43.1	1.0	-60.6	-25.0	-35.6	
7778.97	-17.1	V	3.0	42.5	1.0	-58.6	-25.0	-33.6	
10371.96	-13.2	V	3.0	41.3	1.0	-53.5	-25.0	-28.5	
5185.98	-18.2	H	3.0	43.1	1.0	-60.3	-25.0	-35.3	
7778.97	-17.1	H	3.0	42.5	1.0	-58.6	-25.0	-33.6	
10371.96	-13.3	H	3.0	41.3	1.0	-53.6	-25.0	-28.6	
High Ch, 2640MHz									
5280.00	-18.3	V	3.0	43.1	1.0	-60.4	-25.0	-35.4	
7920.00	-16.6	V	3.0	42.5	1.0	-58.1	-25.0	-33.1	
10560.00	-13.1	V	3.0	41.3	1.0	-53.4	-25.0	-28.4	
5280.00	-18.0	H	3.0	43.1	1.0	-60.1	-25.0	-35.1	
7920.00	-16.8	H	3.0	42.5	1.0	-58.2	-25.0	-33.2	
10560.00	-12.9	H	3.0	41.3	1.0	-53.2	-25.0	-28.2	

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NR Band n77 (3450 – 3550 MHz)

60MHz

QPSK

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)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
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	

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