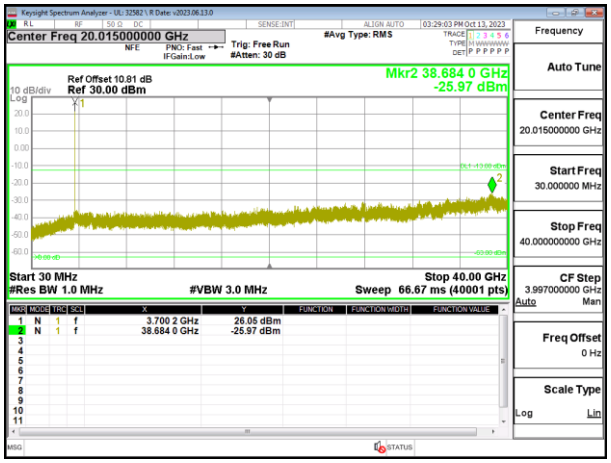
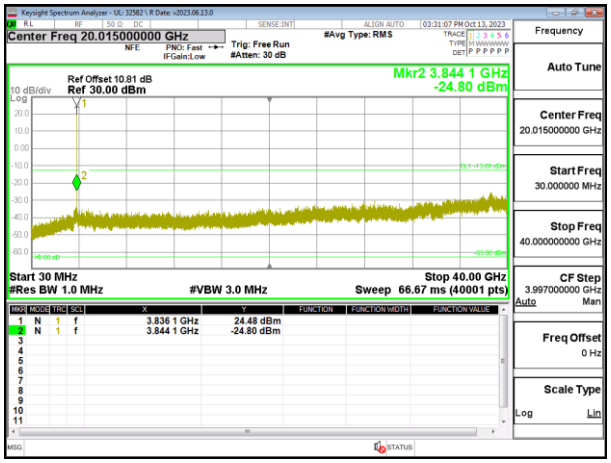
9.2.7. 5G NR n77 (FCC Part 27 3700-3980MHz)

LIMITS

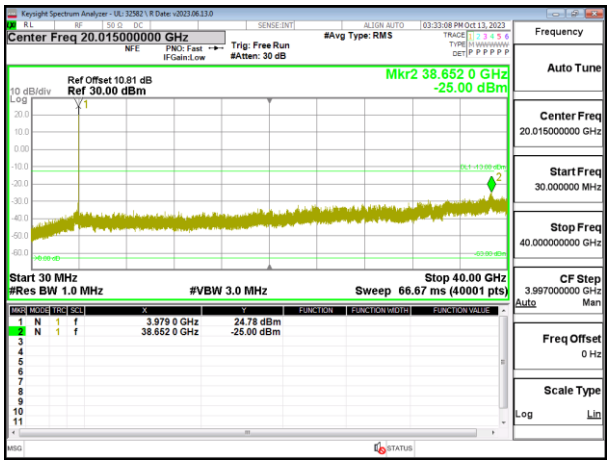
FCC: §27.53
Emission limits
(l) 3.7 GHz Service. The following emission limits apply to stations transmitting in the 3700-3980 MHz band:
(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.



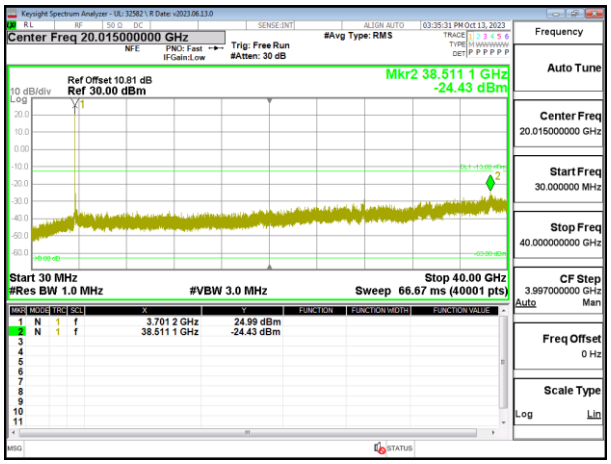
5G NR n77 10MHz QPSK Low Channel RB1-0



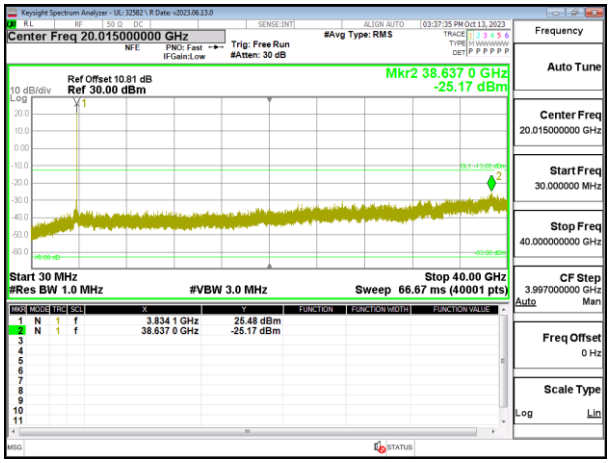
5G NR n77 10MHz QPSK Middle Channel RB1-1



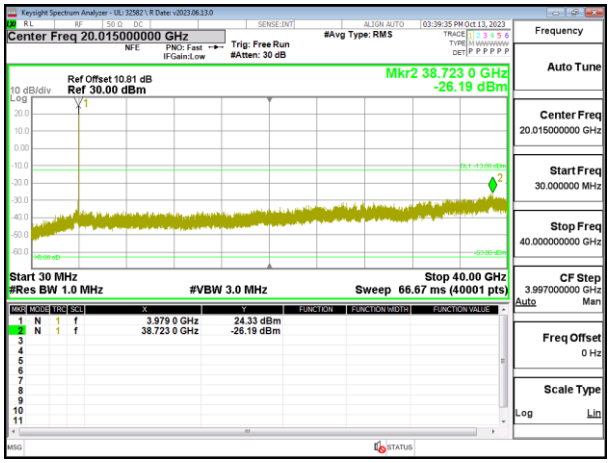
5G NR n77 10MHz QPSK High Channel RB1-23



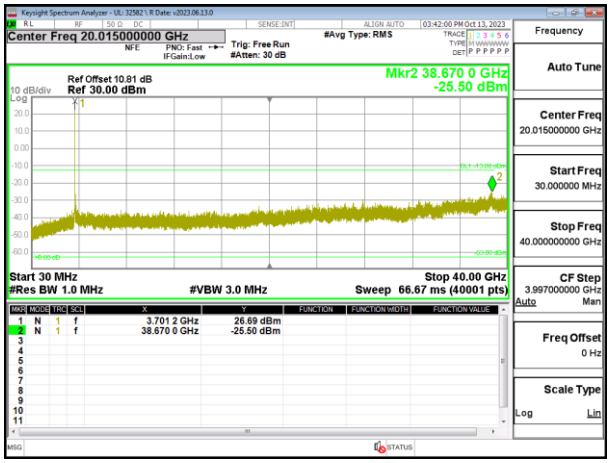
5G NR n77 15MHz QPSK Low Channel RB1-0



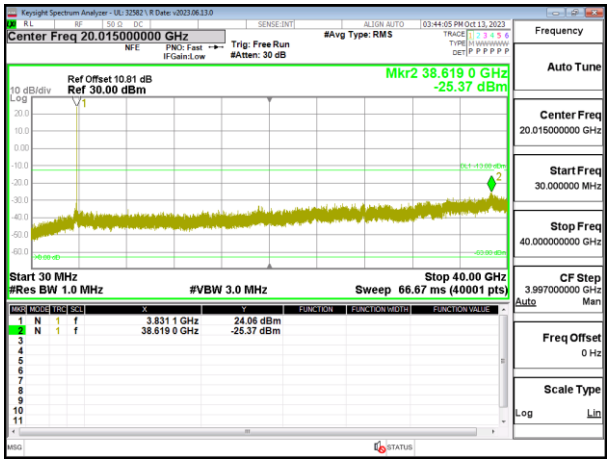
5G NR n77 15MHz QPSK Middle Channel RB1-1



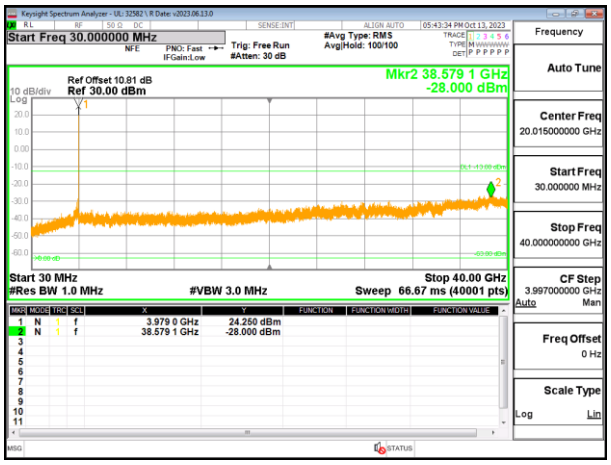
5G NR n77 15MHz QPSK High Channel RB1-37



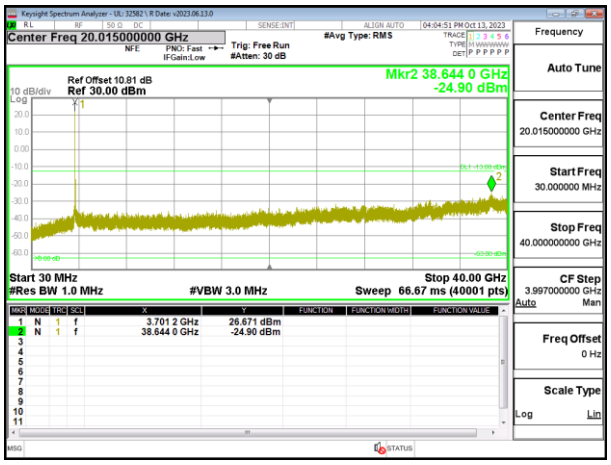
5G NR n77 20MHz QPSK Low Channel RB1-1



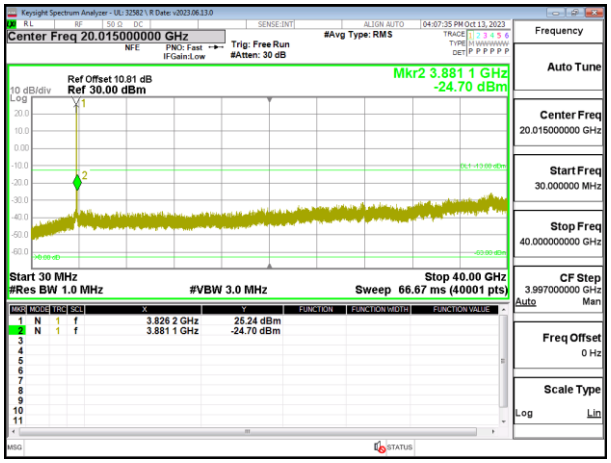
5G NR n77 20MHz QPSK Middle Channel RB1-1



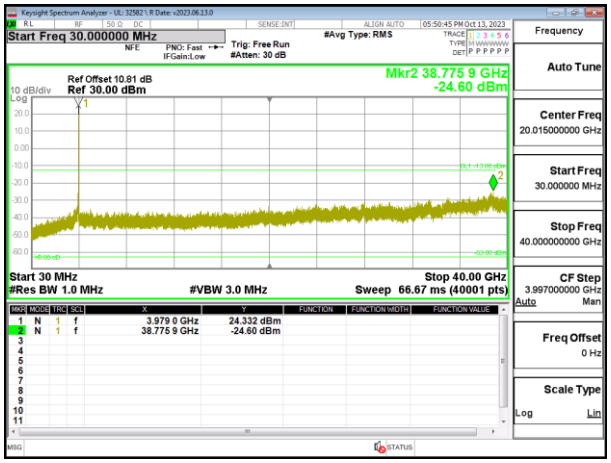
5G NR n77 20MHz QPSK High Channel RB1-50



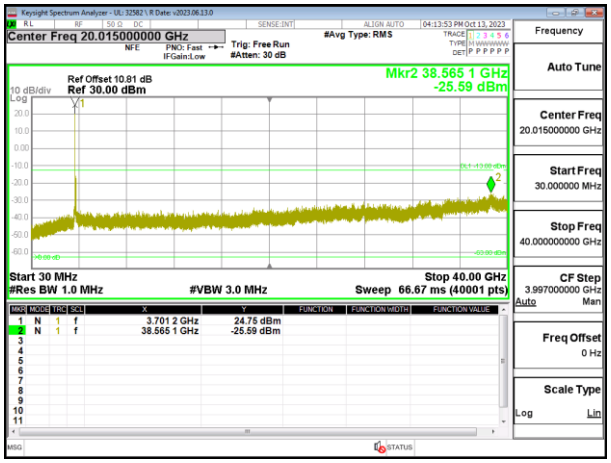
5G NR n77 30MHz QPSK Low Channel RB1-0



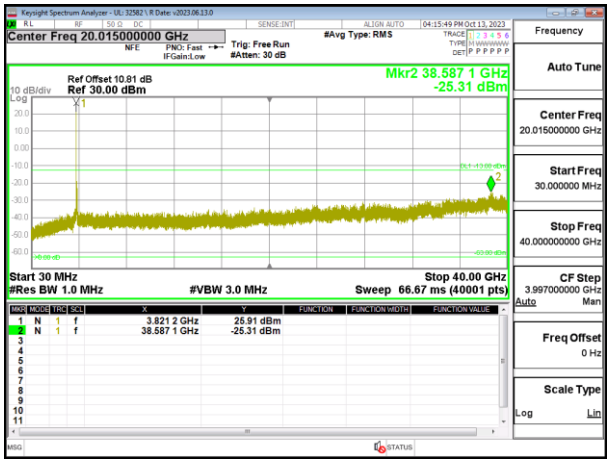
5G NR n77 30MHz QPSK Middle Channel RB1-1



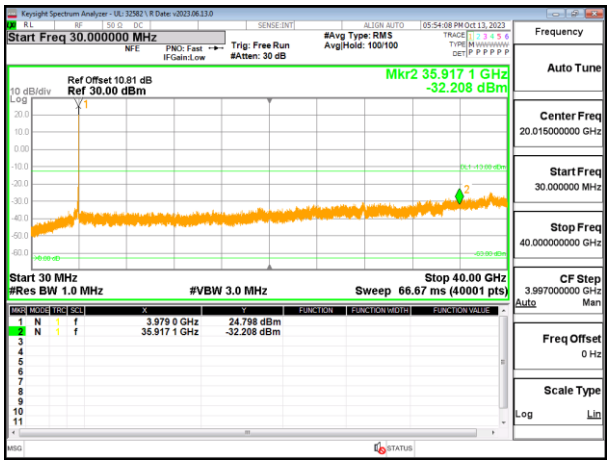
5G NR n77 30MHz QPSK High Channel RB1-77



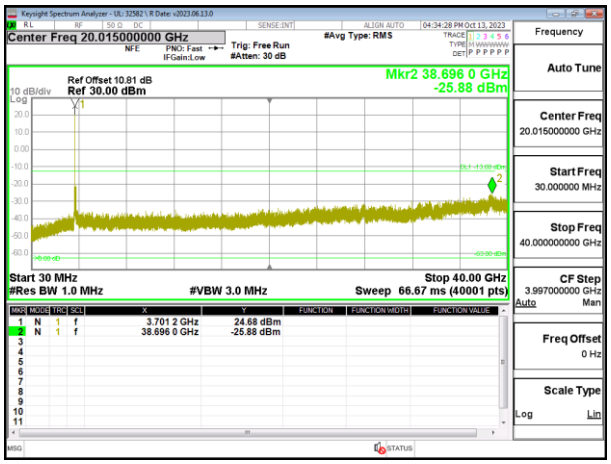
5G NR n77 40MHz QPSK Low Channel RB1-0



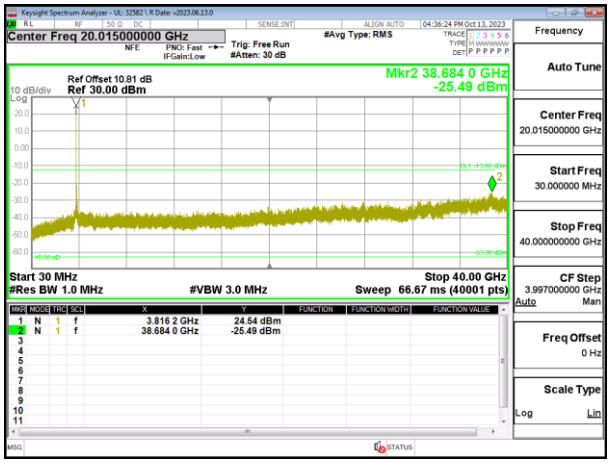
5G NR n77 40MHz QPSK Middle Channel RB1-1



5G NR n77 40MHz QPSK High Channel RB1-105

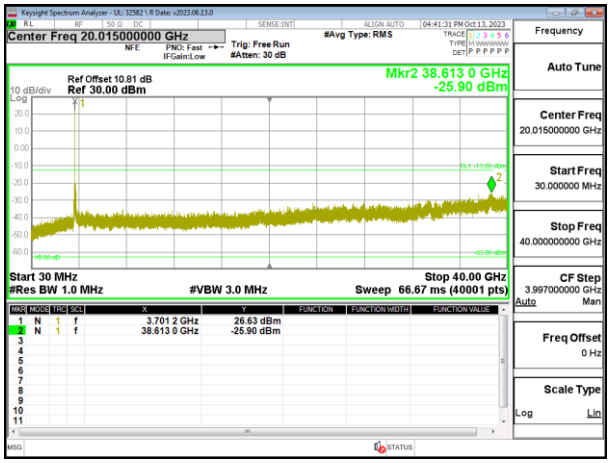


5G NR n77 50MHz QPSK Middle Channel RB1-0

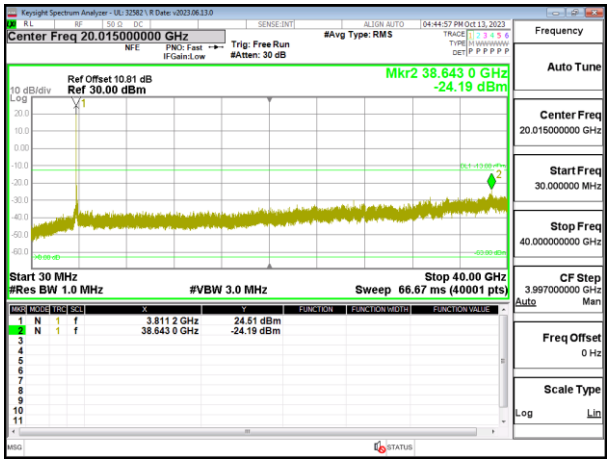


5G NR n77 50MHz QPSK Middle Channel RB1-1

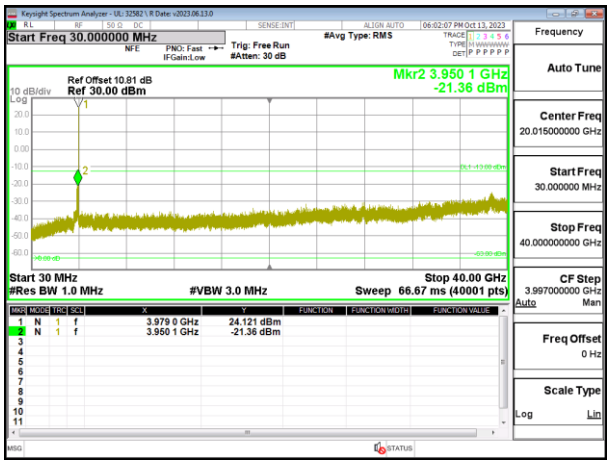
5G NR n77 50MHz QPSK High Channel RB1-132



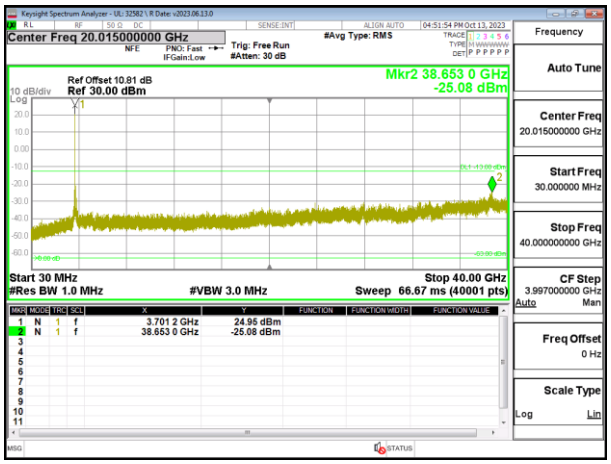
5G NR n77 60MHz QPSK Low Channel RB1-0



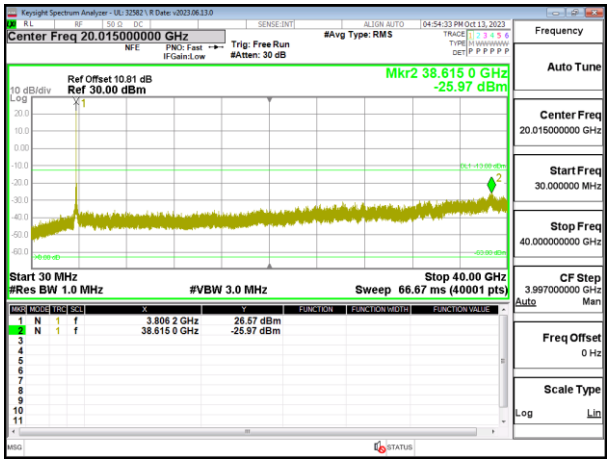
5G NR n77 60MHz QPSK Middle Channel RB1-1



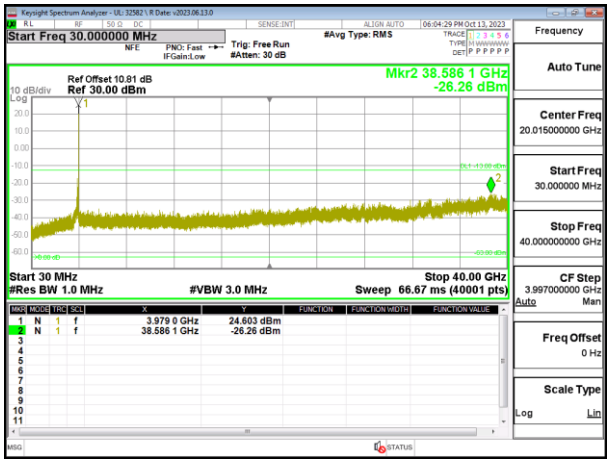
5G NR n77 60MHz QPSK High Channel RB1-161



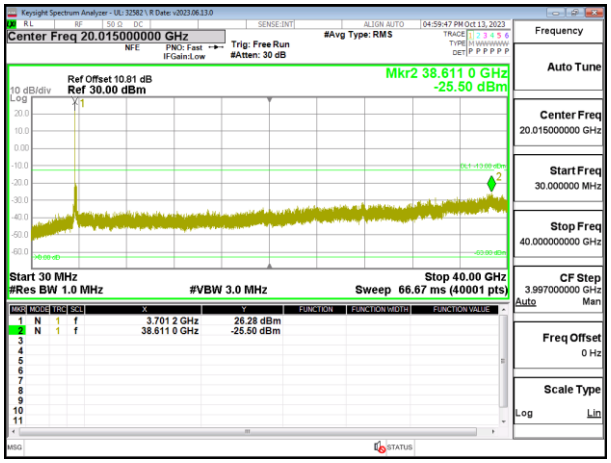
5G NR n77 70MHz QPSK Low Channel RB1-0



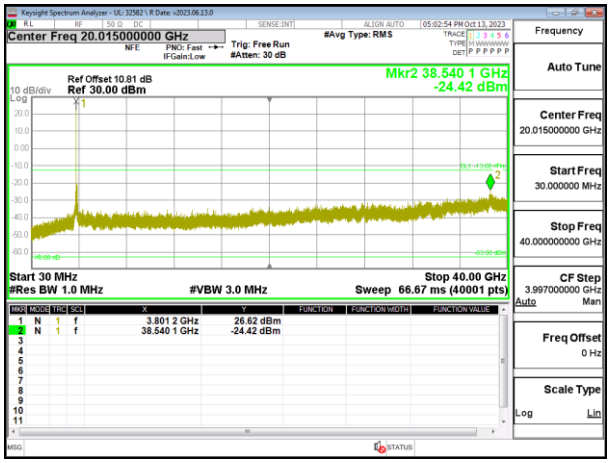
5G NR n77 70MHz QPSK Middle Channel RB1-1



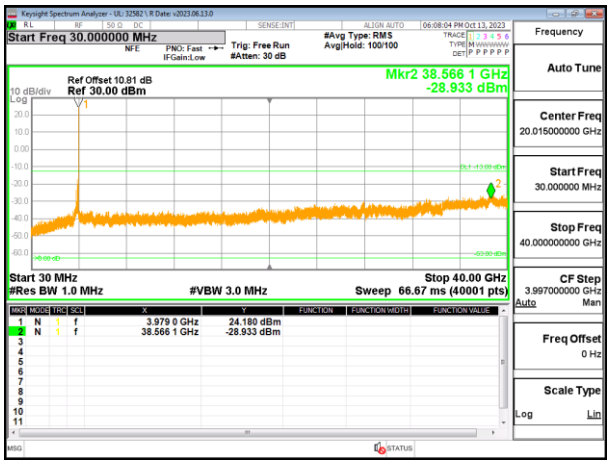
5G NR n77 70MHz QPSK High Channel RB1-188



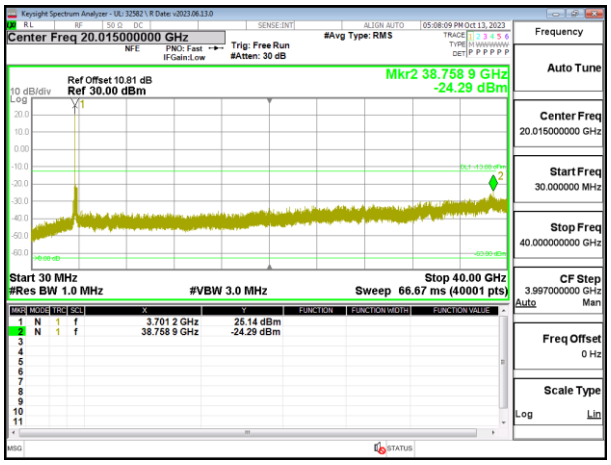
5G NR n77 80MHz QPSK Low Channel RB1-0



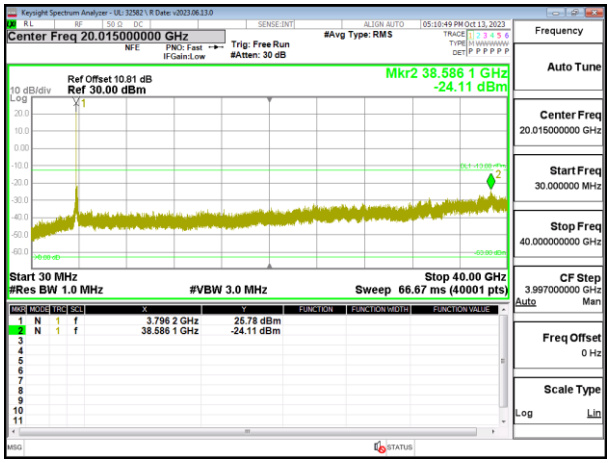
5G NR n77 80MHz QPSK Middle Channel RB1-1



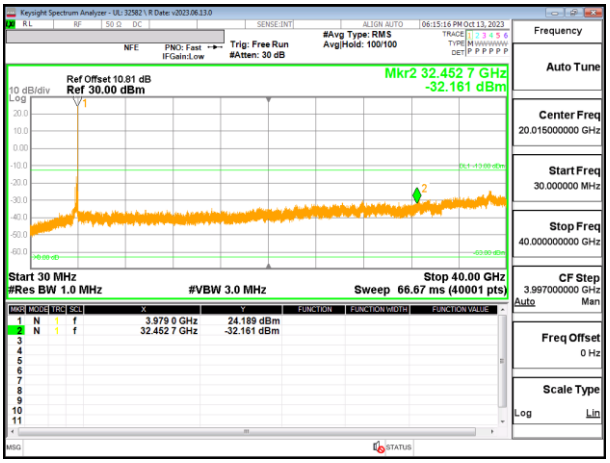
5G NR n77 80MHz QPSK High Channel RB1-216



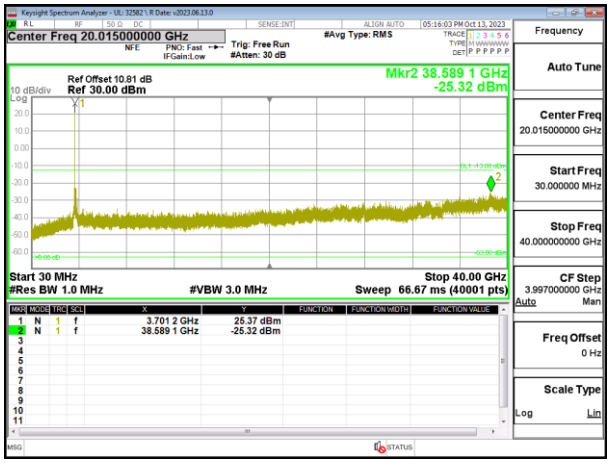
5G NR n77 90MHz QPSK Low Channel RB1-0



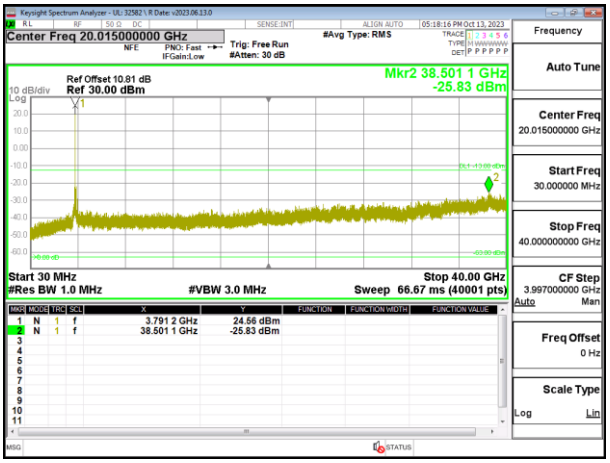
5G NR n77 90MHz QPSK Middle Channel RB1-1



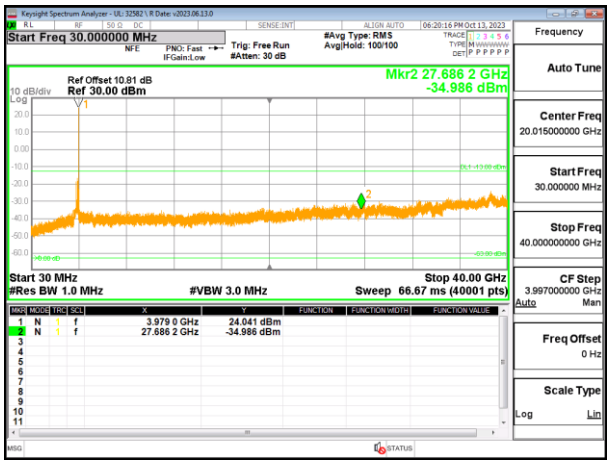
5G NR n77 90MHz QPSK High Channel RB1-244



5G NR n77 100MHz QPSK Low Channel RB1-1



5G NR n77 100MHz QPSK Middle Channel RB1-1



5G NR n77 100MHz QPSK High Channel RB1-272

9.3. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, and §27.54

LIMITS

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

FCC §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use UXM with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.2725VDC, Normal, 3.85VDC and High voltage, 4.4275VDC.
  End Voltage, 2.8VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

9.3.1. 5G NR n5 (FCC Part 22)

LIMITS

FCC: §22.917 (a)
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 SRSP for mobile stations and±1.5 ppm for base stations.
In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

Test Engineer ID:	32546	Test Date:	10/17/2023

5G NR n5 QPSK (20MHz BANDWIDTH)

Band	5	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)		824.5324	847.3615			
Extreme (50°C)		824.5324	847.3615	1.7	0.002	Yes
Extreme (40°C)		824.5324	847.3615	1.6	0.002	Yes
Extreme (30°C)		824.5324	847.3615	2.3	0.003	Yes
Extreme (10°C)	Normal	824.5324	847.3615	2.1	0.003	Yes
Extreme (0°C)		824.5324	847.3615	2.6	0.003	Yes
Extreme (-10°C)		824.5324	847.3615	1.7	0.002	Yes
Extreme (-20°C)		824.5324	847.3615	2.2	0.003	Yes
Extreme (-30°C)		824.5324	847.3615	2.8	0.003	Yes
20°C	15%	824.5324	847.3615	2.1	0.003	Yes
	-15%	824.5324	847.3615	1.6	0.002	Yes

9.3.2. 5G NR n26 (FCC PART 90S)

LIMITS

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

Test Engineer ID:	32546	Test Date:	10/17/2023

5G NR n26 QPSK (10MHz BANDWIDTH)

Band	26	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		814	824		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	814.2068	823.3589			
Extreme (50°C)		814.2068	823.3589	-3.4	-0.004	Yes
Extreme (40°C)		814.2068	823.3589	-2.7	-0.003	Yes
Extreme (30°C)		814.2068	823.3589	-2.3	-0.003	Yes
Extreme (10°C)		814.2068	823.3589	-2.6	-0.003	Yes
Extreme (0°C)		814.2068	823.3589	-0.9	-0.001	Yes
Extreme (-10°C)		814.2068	823.3589	-2.5	-0.003	Yes
Extreme (-20°C)		814.2068	823.3589	-2.2	-0.003	Yes
Extreme (-30°C)		814.2068	823.3589	-3.5	-0.004	Yes
20°C	15%	814.2068	823.3589	-2.7	-0.003	Yes
	-15%	814.2068	823.3589	-3.3	-0.004	Yes

9.3.3. 5G NR n26 (FCC PART 22)

LIMITS

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

Test Engineer ID:	32546	Test Date:	10/17/2023

5G NR n26 QPSK (20MHz BANDWIDTH)

Band	26	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	824.5129	847.3628			
Extreme (50°C)		824.5129	847.3628	-1.7	-0.002	Yes
Extreme (40°C)		824.5129	847.3628	-2.2	-0.003	Yes
Extreme (30°C)		824.5129	847.3628	-1.2	-0.001	Yes
Extreme (10°C)		824.5129	847.3628	1.9	0.002	Yes
Extreme (0°C)		824.5129	847.3628	2.2	0.003	Yes
Extreme (-10°C)		824.5129	847.3628	1.8	0.002	Yes
Extreme (-20°C)		824.5129	847.3628	-1.6	-0.002	Yes
Extreme (-30°C)		824.5129	847.3628	-1.1	-0.001	Yes
20°C	15%	824.5129	847.3628	2.4	0.003	Yes
	-15%	824.5129	847.3628	-1.9	-0.002	Yes

9.3.4. 5G NR n41 (FCC Part 27)

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	32546	Test Date:	10/19/2023

5G NR n41 QPSK (100MHz BANDWIDTH)

Band	41	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2496	2690		0	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)		2497.2275	2687.7296			
Extreme (50°C)		2497.2275	2687.7296	-4.1	-0.002	Yes
Extreme (40°C)		2497.2275	2687.7296	-2.6	-0.001	Yes
Extreme (30°C)		2497.2275	2687.7296	-5.2	-0.002	Yes
Extreme (10°C)	Normal	2497.2275	2687.7296	-3.7	-0.001	Yes
Extreme (0°C)		2497.2275	2687.7296	-2.3	-0.001	Yes
Extreme (-10°C)		2497.2275	2687.7296	-2.0	-0.001	Yes
Extreme (-20°C)		2497.2275	2687.7296	-2.8	-0.001	Yes
Extreme (-30°C)		2497.2275	2687.7296	-1.3	0.000	Yes
20°C	15%	2497.2275	2687.7296	-3.5	-0.001	Yes
	-15%	2497.2275	2687.7296	-1.8	-0.001	Yes

9.3.5. 5G NR n66 (FCC Part 27)

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	32546	Test Date:	10/16/2023

5G NR n66 QPSK (40MHz BANDWIDTH)

Band	66	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1710	1780			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	1710.5159	1778.3569			
Extreme (50°C)		1710.5159	1778.3569	-3.4	-0.002	Yes
Extreme (40°C)		1710.5159	1778.3569	-2.9	-0.002	Yes
Extreme (30°C)		1710.5159	1778.3569	-2.9	-0.002	Yes
Extreme (10°C)		1710.5159	1778.3569	2.0	0.001	Yes
Extreme (0°C)		1710.5159	1778.3569	2.8	0.002	Yes
Extreme (-10°C)		1710.5159	1778.3569	1.9	0.001	Yes
Extreme (-20°C)		1710.5159	1778.3569	2.9	0.002	Yes
Extreme (-30°C)		1710.5159	1778.3569	3.6	0.002	Yes
20°C	15%	1710.5159	1778.3569	-8.8	-0.005	Yes
	-15%	1710.5159	1778.3569	8.1	0.005	Yes

9.3.6. 5G NR n77 (FCC Part 27 3450-3550MHz)

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	27432	Test Date:	10/19/2023

5G NR n77 QPSK (100MHz BANDWIDTH)

Band	77	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		3450	3550			
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)		3451.2321	3547.5948			
Extreme (50°C)		3451.2321	3547.5948	1.6	0.000	Yes
Extreme (40°C)		3451.2321	3547.5948	-1.5	0.000	Yes
Extreme (30°C)		3451.2321	3547.5948	4.8	0.001	Yes
Extreme (10°C)	Normal	3451.2321	3547.5948	3.4	0.001	Yes
Extreme (0°C)		3451.2321	3547.5948	6.7	0.002	Yes
Extreme (-10°C)		3451.2321	3547.5948	4.9	0.001	Yes
Extreme (-20°C)		3451.2321	3547.5948	8.5	0.002	Yes
Extreme (-30°C)		3451.2321	3547.5948	9.2	0.003	Yes
20°C	15%	3451.2321	3547.5948	-3.5	-0.001	Yes
	-15%	3451.2321	3547.5948	1.1	0.000	Yes

9.3.7. 5G NR n77 (FCC Part 27 3700-3980MHz)

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	27432	Test Date:	10/19/2023

5G NR n77 QPSK (100MHz BANDWIDTH)

Band	77	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		3700	3980			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	3701.2345	3977.5535			
Extreme (50°C)		3701.2345	3977.5535	-4.2	-0.001	Yes
Extreme (40°C)		3701.2345	3977.5535	2.8	0.001	Yes
Extreme (30°C)		3701.2345	3977.5535	3.7	0.001	Yes
Extreme (10°C)		3701.2345	3977.5535	2.1	0.001	Yes
Extreme (0°C)		3701.2345	3977.5535	3.3	0.001	Yes
Extreme (-10°C)		3701.2345	3977.5535	4.2	0.001	Yes
Extreme (-20°C)		3701.2345	3977.5535	3.0	0.001	Yes
Extreme (-30°C)		3701.2345	3977.5535	3.5	0.001	Yes
20°C	15%	3701.2345	3977.5535	4.3	0.001	Yes
	-15%	3701.2345	3977.5535	2.3	0.001	Yes

9.4. PEAK-TO-AVERAGE POWER RATIO

LIMITS

In addition, the peak to average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

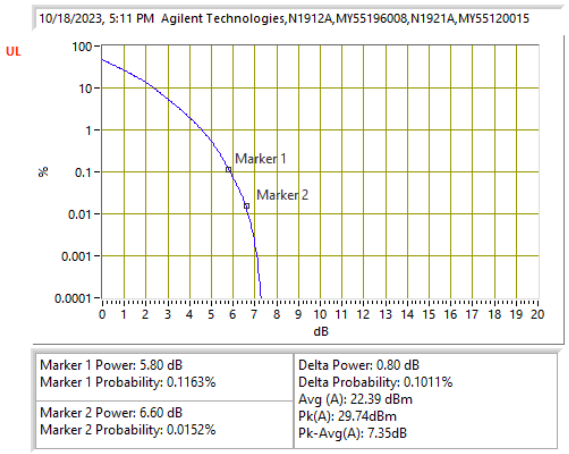
RESULT

The results from all CCDF plots are passed with 13dB peak-to-average power ratio criteria.

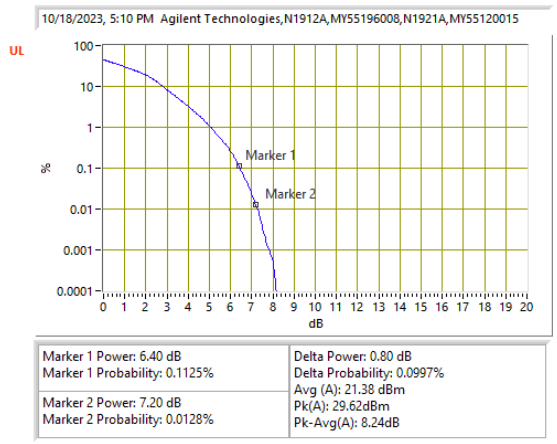
9.4.1. 5G NR n5 (FCC Part 22)

5G NR n5

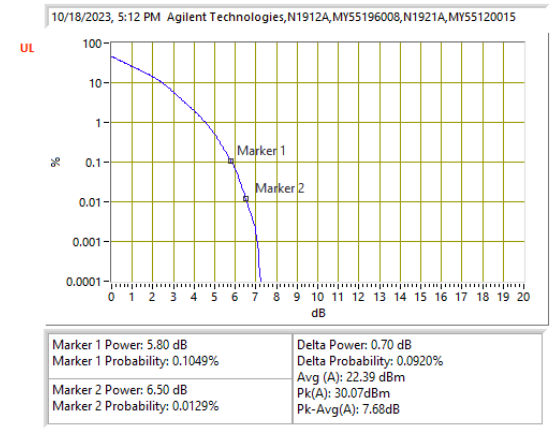
Test Engineer ID:	28774	Test Date:	10/31/2023



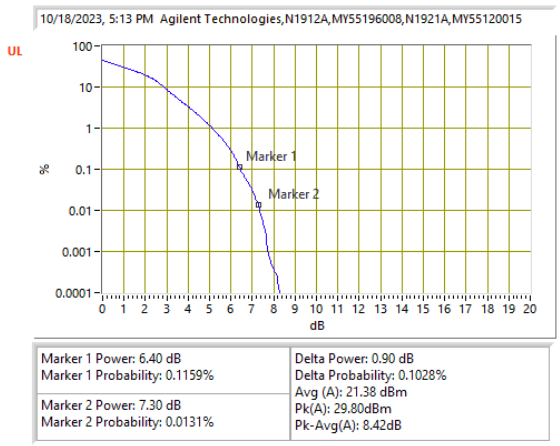
5G NR n5 5MHz QPSK Middle Channel



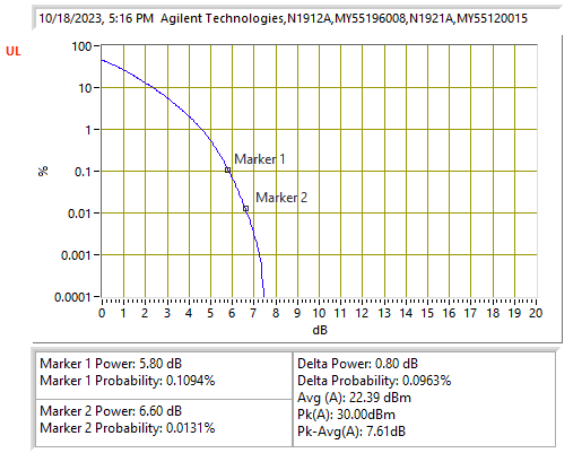
5G NR n5 5MHz 16QAM Middle Channel



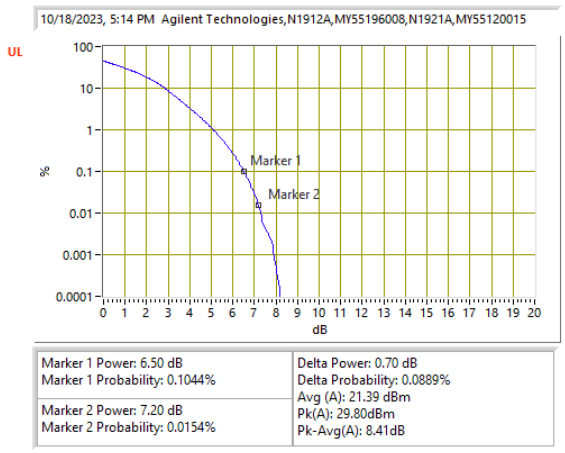
5G NR n5 10MHz QPSK Middle Channel



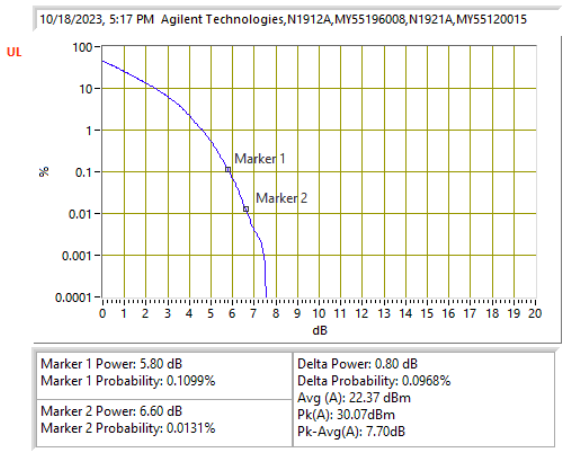
5G NR n5 1MHz 16QAM Middle Channel



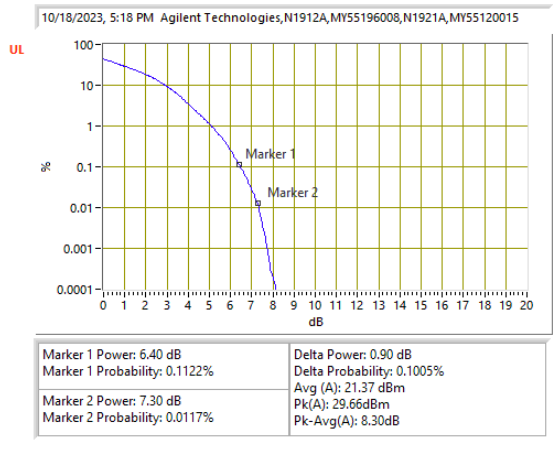
5G NR n5 15MHz QPSK Middle Channel



5G NR n5 15MHz 16QAM Middle Channel



5G NR n5 20MHz QPSK Middle Channel

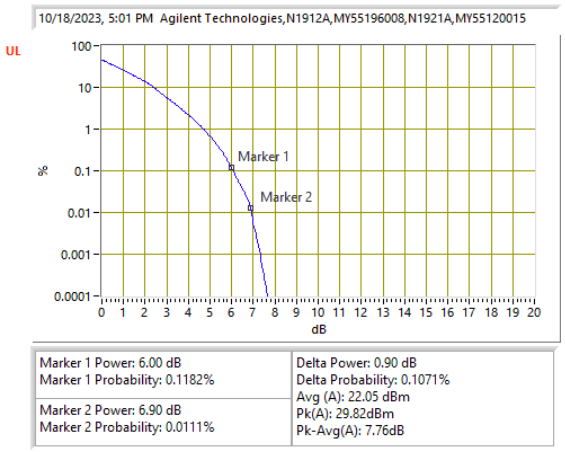


5G NR n5 20MHz 16QAM Middle Channel

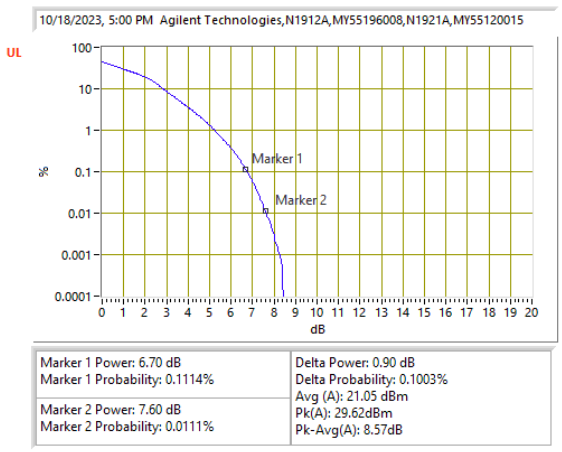
9.4.2. 5G NR n26 (FCC PART 90S)

5G NR n26

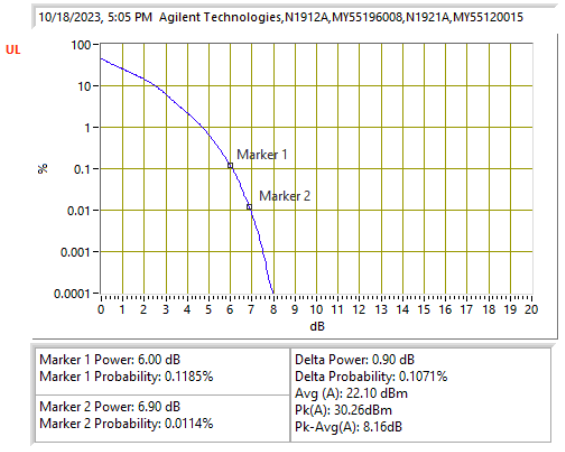
Test Engineer ID:	28774	Test Date:	10/31/2023



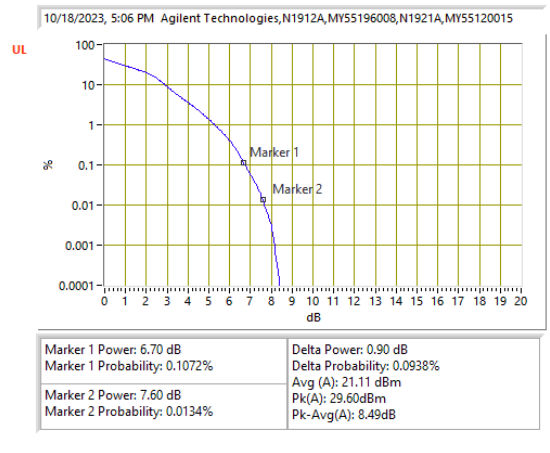
5G NR n26 5MHz QPSK Middle Channel



5G NR n26 5MHz 16QAM Middle Channel



5G NR n26 10MHz QPSK Middle Channel

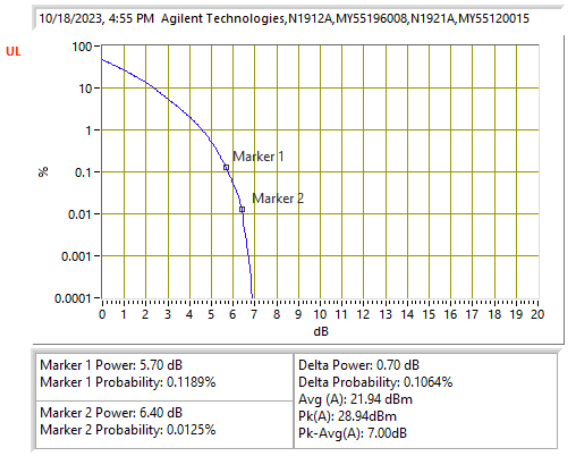


5G NR n26 10MHz 16QAM Middle Channel

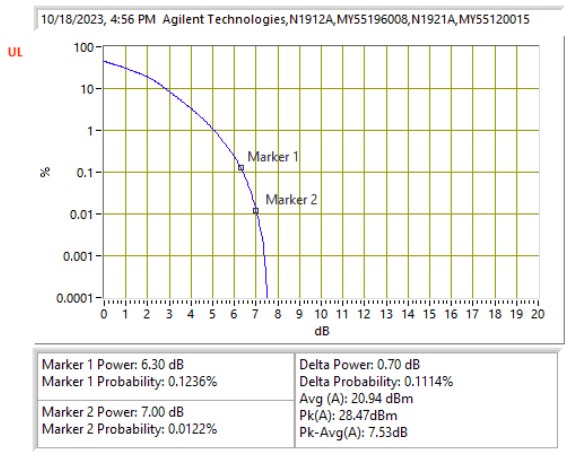
9.4.3. 5G NR n26 (FCC PART 22)

5G NR n26

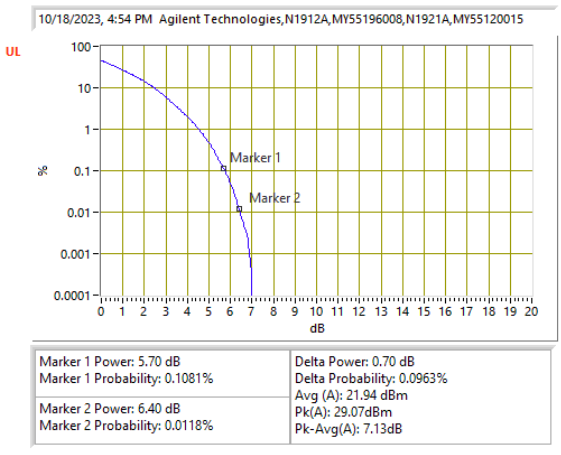
Test Engineer ID:	28774	Test Date:	10/31/2023



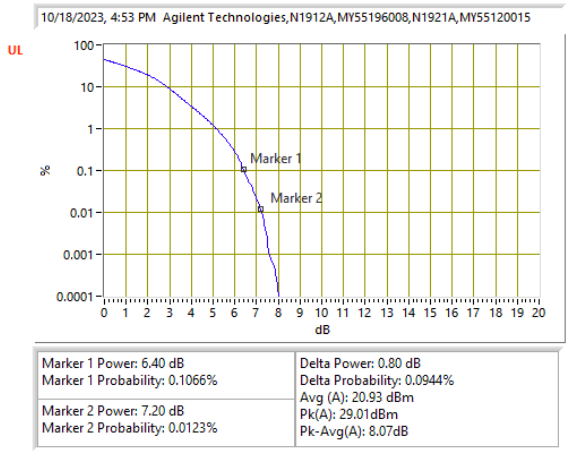
5G NR n26 5MHz QPSK Middle Channel



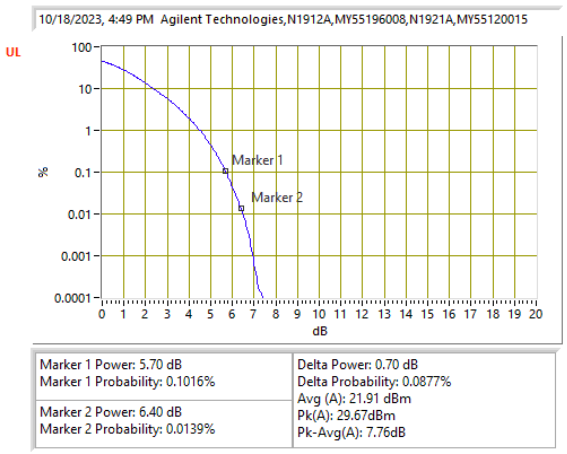
5G NR n26 5MHz 16QAM Middle Channel



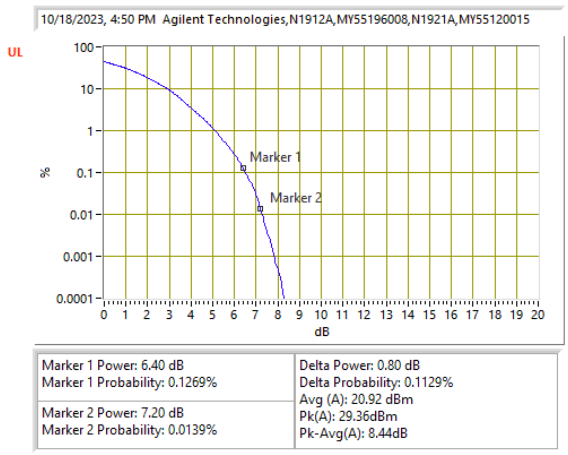
5G NR n26 10MHz QPSK Middle Channel



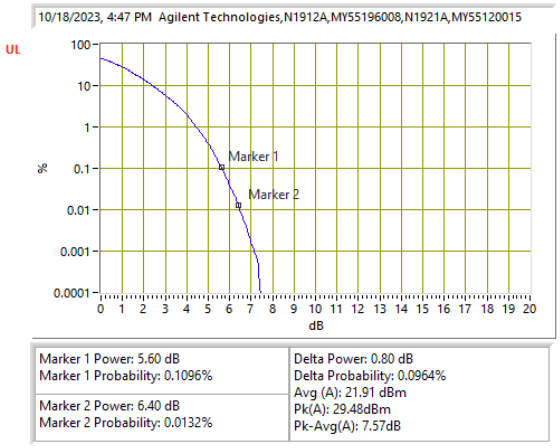
5G NR n26 10MHz 16QAM Middle Channel



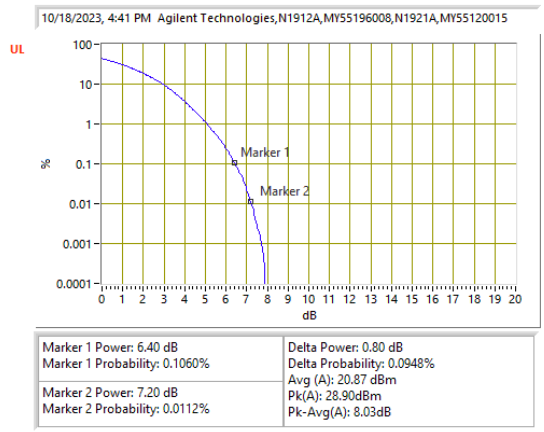
5G NR n26 15MHz QPSK Middle Channel



5G NR n26 15MHz 16QAM Middle Channel



5G NR n26 20MHz QPSK Middle Channel



5G NR n26 20MHz 16QAM Middle Channel

9.4.4. 5G NR n41 (FCC Part 27)

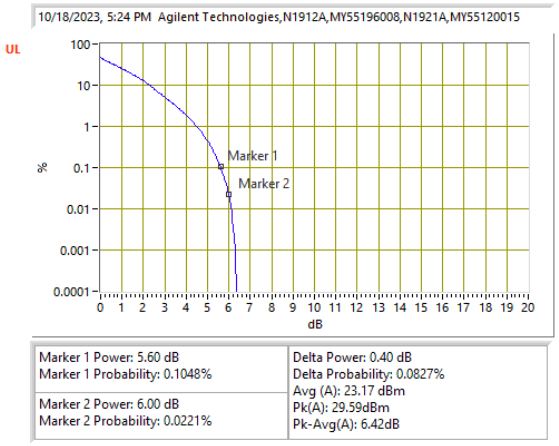
Test Engineer ID:	28774	Test Date:	10/31/2023

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
5G NR n41 (FCC)	10MHz	2593.0	24	0	QPSK	27.46	20.82	6.64
					16QAM	27.56	20.41	7.15
	15MHz		36	0	QPSK	28.14	20.96	7.18
					16QAM	27.67	20.27	7.40
	20MHz		50	0	QPSK	27.94	20.89	7.05
					16QAM	27.85	20.35	7.50
	30MHz		75	0	QPSK	28.33	21.28	7.05
					16QAM	28.23	20.73	7.50
	40MHz		100	0	QPSK	28.37	21.34	7.03
					16QAM	28.39	20.76	7.63
	50MHz		128	0	QPSK	28.41	22.22	6.19
					16QAM	28.69	21.43	7.26
	60MHz		162	0	QPSK	28.01	22.07	5.94
					16QAM	28.50	21.42	7.08
	70MHz		180	0	QPSK	28.17	22.33	5.84
					16QAM	28.44	21.35	7.09
	80MHz		216	0	QPSK	27.77	22.21	5.56
					16QAM	28.22	21.37	6.85
	90MHz		243	0	QPSK	27.74	22.3	5.44
					16QAM	28.12	21.31	6.81
	100MHz		270	0	QPSK	27.12	22.27	4.85
					16QAM	27.68	21.25	6.43
* Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

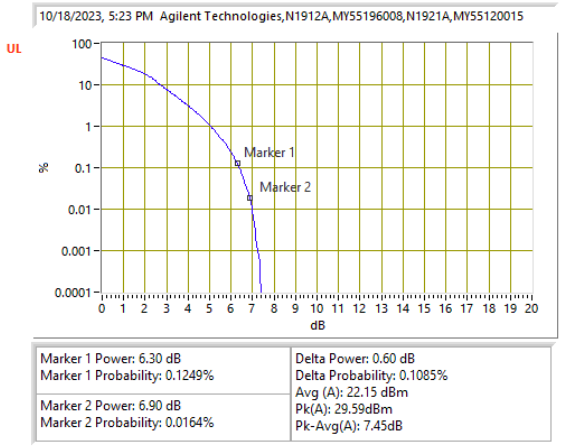
9.4.5. 5G NR n66 (FCC Part 27)

5G NR n66

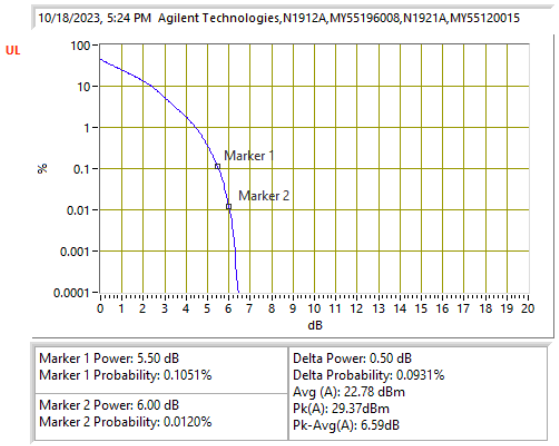
Test Engineer ID:	28774	Test Date:	10/31/2023



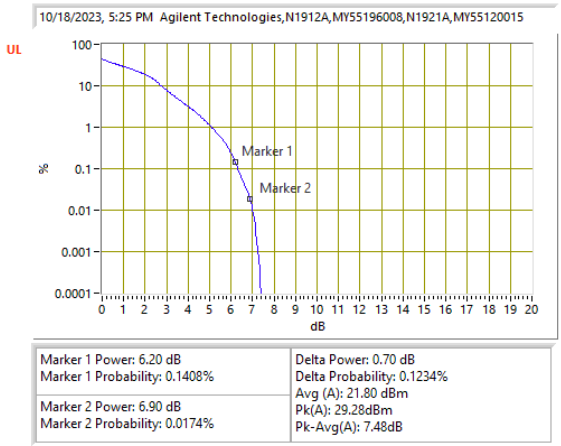
5G NR n66 5MHz QPSK Middle Channel



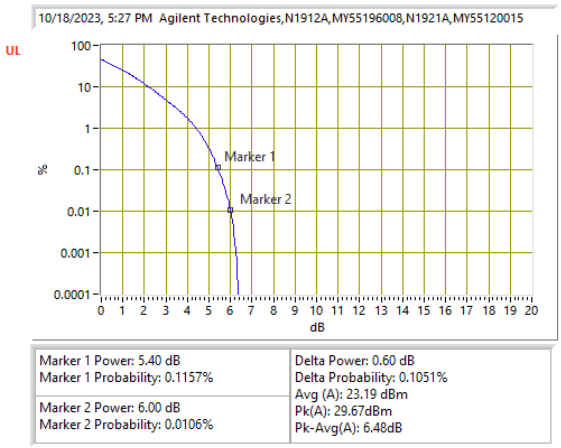
5G NR n66 5MHz 16QAM Middle Channel



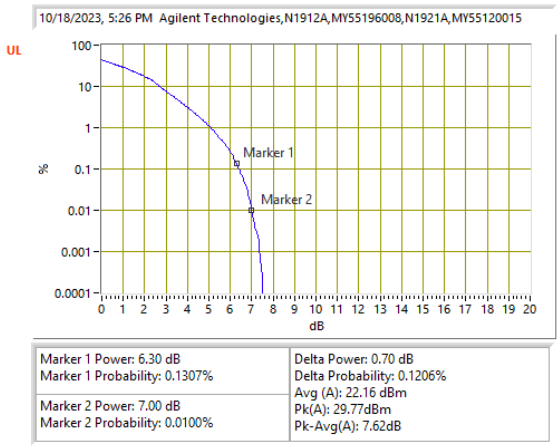
5G NR n66 10MHz QPSK Middle Channel



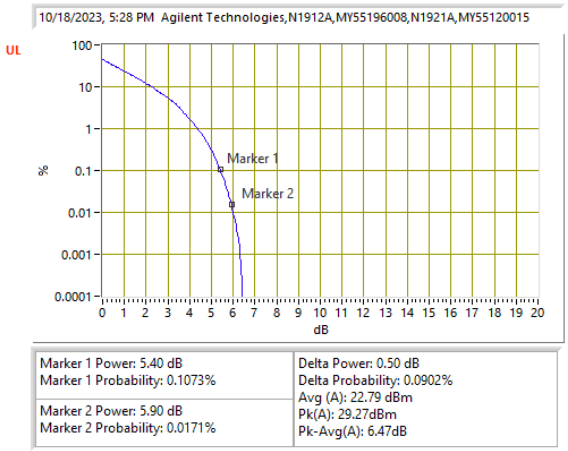
5G NR n66 10MHz 16QAM Middle Channel



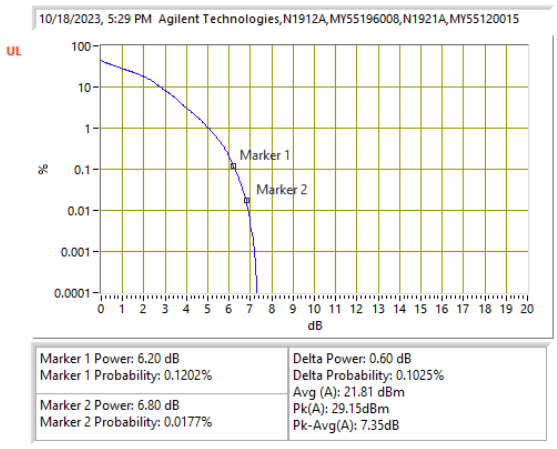
5G NR n66 15MHz QPSK Middle Channel



5G NR n66 15MHz 16QAM Middle Channel



5G NR n66 20MHz QPSK Middle Channel



5G NR n66 20MHz 16QAM Middle Channel

9.4.6. 5G NR n77 (FCC Part 27 3450-3550MHz)

Test Engineer ID:	28774	Test Date:	10/31/2023

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
5G NR n77 (FCC Part 27 3450-3550MHz)	10MHz	3500.0	24	0	QPSK	26.64	20.05	6.59
					16QAM	26.46	19.6	6.86
	15MHz		36	0	QPSK	26.26	19.21	7.05
					16QAM	26.16	18.91	7.25
	20MHz		50	0	QPSK	26.05	19.13	6.92
					16QAM	26.22	18.88	7.34
	25MHz		64	0	QPSK	26.40	19.42	6.98
					16QAM	26.55	19.17	7.38
	30MHz		75	0	QPSK	26.84	19.81	7.03
					16QAM	26.95	19.55	7.40
	40MHz		100	0	QPSK	27.03	19.98	7.05
					16QAM	27.54	19.76	7.78
	50MHz		128	0	QPSK	26.34	19.57	6.77
					16QAM	26.90	19.3	7.60
	60MHz		162	0	QPSK	26.34	19.67	6.67
					16QAM	26.88	19.34	7.54
	70MHz		180	0	QPSK	26.19	19.67	6.52
					16QAM	26.77	19.31	7.46
	80MHz		216	0	QPSK	25.94	19.58	6.36
					16QAM	26.31	19.25	7.06
	90MHz		243	0	QPSK	25.42	19.53	5.89
					16QAM	26.31	19.2	7.11
	100MHz		270	0	QPSK	24.93	19.34	5.59
					16QAM	26.09	19.1	6.99

9.4.7. 5G NR n77 (FCC Part 27 3700-3980MHz)

Test Engineer ID:	28774	Test Date:	10/31/2023

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
5G NR n77 (FCC Part 27 3700-3980MHz)	10MHz	3840.0	24	0	QPSK	25.54	18.65	6.89
					16QAM	25.59	18.46	7.13
	15MHz		36	0	QPSK	25.54	18.5	7.04
					16QAM	25.57	18.33	7.24
	20MHz		50	0	QPSK	25.44	18.61	6.83
					16QAM	25.70	18.37	7.33
	25MHz		64	0	QPSK	25.97	18.78	7.19
					16QAM	26.14	18.57	7.57
	30MHz		75	0	QPSK	26.18	18.92	7.26
					16QAM	26.29	18.66	7.63
	40MHz		100	0	QPSK	26.42	19.17	7.25
					16QAM	26.88	18.9	7.98
	50MHz		128	0	QPSK	25.63	18.72	6.91
					16QAM	26.20	18.44	7.76
	60MHz		162	0	QPSK	25.52	18.77	6.75
					16QAM	26.15	18.48	7.67
	70MHz		180	0	QPSK	25.37	18.82	6.55
					16QAM	26.03	18.57	7.46
	80MHz		216	0	QPSK	25.19	18.7	6.49
					16QAM	25.56	18.38	7.18
	90MHz		243	0	QPSK	24.63	18.66	5.97
					16QAM	25.59	18.37	7.22
	100MHz		270	0	QPSK	24.23	18.49	5.74
					16QAM	25.20	18.19	7.01

10. RADIATED TEST RESULTS

10.1. EFFECTIVE RADIATED POWER ERP/EIRP

RULE PART(S)

FCC: §2.1046, §22.913, §27.50, §90.691

LIMITS

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

27.50(d) - (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.(Band 66 / 5G NR n66)

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.

27.50(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.

27.50(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 (2016), Clause 2.2.17; PSA setting reference to 971168 D01 v03r01

For peak power measurement with a PSA:

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

For average power measurement with a PSA:

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

TEST RESULTS

5G NR n5 (FCC PART 22)

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	W
20	QPSK	1/1	834	19.83	0.0962
		1/1	836.5	19.21	0.0834
		1/1	839	19.16	0.0824
	16QAM	1/1	834	18.56	0.0718
		1/1	836.5	18.10	0.0646
		1/1	839	18.67	0.0736
15	QPSK	1/1	831.5	19.48	0.0887
		1/1	836.5	18.46	0.0701
		1/1	841.5	19.50	0.0891
	16QAM	1/1	831.5	18.40	0.0692
		1/1	836.5	17.93	0.0621
		1/1	841.5	18.36	0.0685
10	QPSK	1/1	826.5	19.22	0.0836
		1/1	836.5	19.98	0.0995
		1/1	844	19.00	0.0794
	16QAM	1/1	826.5	18.89	0.0774
		1/1	836.5	18.59	0.0723
		1/1	844	17.85	0.0610
5	QPSK	1/1	826.5	19.22	0.0836
		1/1	836.5	19.46	0.0883
		1/1	846.5	19.42	0.0875
	16QAM	1/1	826.5	18.09	0.0644
		1/1	836.5	18.15	0.0653
		1/1	846.5	18.23	0.0665

5G NR n26 (FCC PART 90S)

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	W
20	QPSK				
		1/1	824	21.04	0.1271
	16QAM				
		1/1	824	19.88	0.0973
15	QPSK				
		1/1	821.5	20.01	0.1002
		1/1	824	20.16	0.1038
	16QAM				
		1/1	821.5	18.72	0.0745
		1/1	824	18.94	0.0783
10	QPSK				
		1/1	819	19.55	0.0902
	16QAM				
		1/1	819	18.33	0.0681
5	QPSK	1/1	816.5	18.78	0.0755
		1/1	819	19.65	0.0923
		1/1	821.5	19.52	0.0895
	16QAM	1/1	816.5	16.51	0.0448
		1/1	819	18.46	0.0701
		1/1	821.5	17.22	0.0527

5G NR n26 (FCC PART 22)

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	W
20	QPSK	1/1	834	20.67	0.1167
		1/1	836.5	20.62	0.1153
		1/1	834	20.31	0.1074
	16QAM	1/1	834	19.43	0.0877
		1/1	836.5	19.37	0.0865
		1/1	834	19.07	0.0807
15	QPSK	1/1	831.5	20.81	0.1205
		1/1	836.5	20.90	0.1230
		1/1	841.5	20.48	0.1117
	16QAM	1/1	831.5	19.56	0.0904
		1/1	836.5	19.71	0.0935
		1/1	841.5	19.33	0.0857
10	QPSK	1/1	829.0	20.71	0.1178
		1/1	836.5	20.68	0.1169
		1/1	844.0	19.85	0.0966
	16QAM	1/1	829.0	19.44	0.0879
		1/1	836.5	19.42	0.0875
		1/1	844.0	18.57	0.0719
5	QPSK	1/1	826.5	20.97	0.1250
		1/1	836.5	20.52	0.1127
		1/1	846.5	20.85	0.1216
	16QAM	1/1	826.5	19.77	0.0948
		1/1	836.5	19.28	0.0847
		1/1	846.5	19.51	0.0893

5G NR n41 (FCC PART 27)

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
100	QPSK	1/1	2546	22.94	0.1968
		1/1	2593	22.81	0.1910
		1/1	2640	20.34	0.1081
	16QAM	1/1	2546	21.19	0.1315
		1/1	2593	21.01	0.1262
		1/1	2640	19.71	0.0935
90	QPSK	1/1	2541	22.67	0.1849
		1/1	2593	23.35	0.2163
		1/1	2644	21.69	0.1476
	16QAM	1/1	2541	19.77	0.0948
		1/1	2593	21.92	0.1556
		1/1	2644	20.78	0.1197
80	QPSK	1/1	2536	20.90	0.1230
		1/1	2593	21.92	0.1556
		1/1	2650	20.82	0.1208
	16QAM	1/1	2536	19.56	0.0904
		1/1	2593	20.04	0.1009
		1/1	2650	20.42	0.1102
70	QPSK	1/1	2631	21.27	0.1340
		1/1	2593	21.90	0.1549
		1/1	2655	19.50	0.0891
	16QAM	1/1	2631	19.25	0.0841
		1/1	2593	20.73	0.1183
		1/1	2655	18.86	0.0769
60	QPSK	1/1	2526	18.79	0.0757
		1/1	2593	21.24	0.1330
		1/1	2660	22.58	0.1811
	16QAM	1/1	2526	18.38	0.0689
		1/1	2593	20.56	0.1138
		1/1	2660	20.52	0.1127
50	QPSK	1/1	2512	20.63	0.1156
		1/1	2593	21.08	0.1282
		1/1	2665	21.38	0.1374
	16QAM	1/1	2512	18.38	0.0689
		1/1	2593	20.80	0.1202
		1/1	2665	20.73	0.1183

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
40	QPSK	1/1	2516	19.30	0.0851
		1/1	2593	20.39	0.1094
		1/1	2670	20.59	0.1146
	16QAM	1/1	2516	18.83	0.0764
		1/1	2593	19.66	0.0925
		1/1	2670	19.87	0.0971
30	QPSK	1/1	2511	18.66	0.0735
		1/1	2593	21.48	0.1406
		1/1	2675	21.05	0.1274
	16QAM	1/1	2511	17.12	0.0515
		1/1	2593	20.48	0.1117
		1/1	2675	20.14	0.1033
20	QPSK	1/1	2506	18.46	0.0701
		1/1	2593	19.65	0.0923
		1/1	2680	19.70	0.0933
	16QAM	1/1	2506	17.34	0.0542
		1/1	2593	18.82	0.0762
		1/1	2680	19.08	0.0809
15	QPSK	1/1	2503.5	21.00	0.1259
		1/1	2593	21.28	0.1343
		1/1	2637.75	21.11	0.1291
	16QAM	1/1	2503.5	19.41	0.0873
		1/1	2593	19.36	0.0863
		1/1	2637.75	20.20	0.1047
10	QPSK	1/1	2501	20.70	0.1175
		1/1	2593	21.22	0.1324
		1/1	2639	20.50	0.1122
	16QAM	1/1	2501	19.61	0.0914
		1/1	2593	19.92	0.0982
		1/1	2639	19.12	0.0817

5G NR n66 (FCC PART 27)

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
20	QPSK	1/1	1720	17.77	0.0598
		1/1	1745	16.57	0.0454
		1/1	1770	17.84	0.0608
	16QAM	1/1	1720	15.26	0.0336
		1/1	1745	15.57	0.0361
		1/1	1770	15.30	0.0339
15	QPSK	1/1	1717.5	16.74	0.0472
		1/1	1745	16.21	0.0418
		1/1	1772.5	17.74	0.0594
	16QAM	1/1	1717.5	15.77	0.0378
		1/1	1745	15.32	0.0340
		1/1	1772.5	16.65	0.0462
10	QPSK	1/1	1715	17.29	0.0536
		1/1	1745	17.13	0.0516
		1/1	1775	16.87	0.0486
	16QAM	1/1	1715	16.28	0.0425
		1/1	1745	16.01	0.0399
		1/1	1775	15.83	0.0383
5	QPSK	1/1	1712.5	17.46	0.0557
		1/1	1745	17.86	0.0611
		1/1	1777.5	17.37	0.0546
	16QAM	1/1	1712.5	16.47	0.0444
		1/1	1745	16.72	0.0470
		1/1	1777.5	16.36	0.0433

5G NR n77a (Part 27 3450-3550MHz)

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
100	QPSK				
		1/1	3500	23.94	0.2477
	16QAM				
		1/1	3500	22.15	0.1641
90	QPSK				
		1/1	3500	23.24	0.2109
	16QAM				
		1/1	3500	22.20	0.1660
80	QPSK				
		1/1	3500	22.90	0.1950
	16QAM				
		1/1	3500	21.92	0.1556
70	QPSK				
		1/1	3500	23.13	0.2056
	16QAM				
		1/1	3500	21.72	0.1486
60	QPSK				
		1/0	3500	23.32	0.2148
	16QAM				
		1/1	3500	22.15	0.1641
50	QPSK	1/1	3475	20.91	0.1233
		1/1	3525	21.11	0.1291
	16QAM	1/1	3475	19.85	0.0966
		1/1	3525	20.15	0.1035

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
40	QPSK	1/1	3470	21.62	0.1452
		1/1	3500	23.65	0.2317
		1/1	3530	22.23	0.1671
	16QAM	1/1	3470	20.90	0.1230
		1/1	3500	22.76	0.1888
		1/1	3530	21.38	0.1374
30	QPSK	1/1	3465	21.22	0.1324
		1/1	3500	23.48	0.2228
		1/1	3535	22.09	0.1618
	16QAM	1/1	3465	20.45	0.1109
		1/1	3500	22.38	0.1730
		1/1	3535	21.60	0.1445
25	QPSK	1/1	3463	21.07	0.1279
		1/1	3500	23.40	0.2188
		1/1	3537	21.68	0.1472
	16QAM	1/1	3463	20.45	0.1109
		1/1	3500	22.65	0.1841
		1/1	3537	21.02	0.1265
20	QPSK	1/1	3460	20.66	0.1164
		1/1	3500	21.93	0.1560
		1/1	3540	22.04	0.1600
	16QAM	1/1	3460	20.25	0.1059
		1/1	3500	21.80	0.1514
		1/1	3540	21.41	0.1384
15	QPSK	1/1	3457.5	23.45	0.2213
		1/1	3500	22.27	0.1687
		1/1	3542.5	22.07	0.1611
	16QAM	1/1	3457.5	21.90	0.1549
		1/1	3500	20.12	0.1028
		1/1	3542.5	21.35	0.1365
10	QPSK	1/1	3455	21.48	0.1406
		1/1	3500	21.89	0.1545
		1/1	3545	21.06	0.1276
	16QAM	1/1	3455	20.90	0.1230
		1/1	3500	19.25	0.0841
		1/1	3545	19.59	0.0910

5G NR n77c (Part 27 3700-3980MHz)

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
100	QPSK	1/1	3750	22.94	0.1968
		1/1	3930	22.89	0.1945
	16QAM	1/1	3750	21.83	0.1524
		1/1	3930	21.42	0.1387
90	QPSK	1/1	3745	22.38	0.1730
		1/1	3840	22.69	0.1858
		1/1	3935	22.76	0.1888
	16QAM	1/1	3745	20.97	0.1250
		1/1	3840	20.73	0.1183
		1/1	3935	20.53	0.1130
80	QPSK	1/1	3740	22.50	0.1778
		1/1	3840	22.45	0.1758
		1/1	3940	22.43	0.1750
	16QAM	1/1	3740	21.60	0.1445
		1/1	3840	20.40	0.1096
		1/1	3940	20.18	0.1042
70	QPSK	1/1	3735	22.81	0.1910
		1/1	3840	22.20	0.1660
		1/1	3945	22.55	0.1799
	16QAM	1/1	3735	20.91	0.1233
		1/1	3840	20.59	0.1146
		1/1	3945	20.33	0.1079
60	QPSK	1/1	3730	22.88	0.1941
		1/1	3950	22.39	0.1734
	16QAM	1/1	3730	20.48	0.1117
		1/1	3950	20.51	0.1125
50	QPSK	1/1	3725	22.31	0.1702
		1/1	3840	22.67	0.1849
		1/1	3595	22.98	0.1986
	16QAM	1/1	3725	20.26	0.1062
		1/1	3840	20.27	0.1064
		1/1	3595	20.12	0.1028

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	W
40	QPSK	1/1	3720	23.13	0.2056
		1/1	3840	23.72	0.2355
		1/1	3960	23.43	0.2203
	16QAM	1/1	3720	21.70	0.1479
		1/1	3840	21.11	0.1291
		1/1	3960	21.24	0.1330
30	QPSK	1/1	3715	22.65	0.1841
		1/1	3840	23.02	0.2004
		1/1	3965	23.23	0.2104
	16QAM	1/1	3715	21.06	0.1276
		1/1	3840	21.21	0.1321
		1/1	3965	21.90	0.1549
25	QPSK	1/1	3712.5	22.75	0.1884
		1/1	3840	23.00	0.1995
		1/1	3967.5	23.14	0.2061
	16QAM	1/1	3712.5	21.91	0.1552
		1/1	3840	20.74	0.1186
		1/1	3967.5	21.34	0.1361
20	QPSK	1/1	3710	22.68	0.1854
		1/1	3840	22.54	0.1795
		1/1	3670	22.28	0.1690
	16QAM	1/1	3710	20.81	0.1205
		1/1	3840	20.68	0.1169
		1/1	3670	20.33	0.1079
15	QPSK	1/1	3707.5	22.64	0.1837
		1/1	3840	22.90	0.1950
		1/1	3972.5	22.47	0.1766
	16QAM	1/1	3707.5	21.68	0.1472
		1/1	3840	21.25	0.1334
		1/1	3972.5	21.66	0.1466
10	QPSK	1/1	3705	22.85	0.1928
		1/1	3840	22.08	0.1614
		1/1	3975	22.90	0.1950
	16QAM	1/1	3705	21.00	0.1259
		1/1	3840	20.68	0.1169
		1/1	3975	20.39	0.1094

10.1.1. 5G NR n5

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_QPSK 20 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
834.00	16.81	V	3.9	1.1	14.05	38.5	-24.5	
834.00	23.09	H	3.9	0.6	19.83	38.5	-18.7	
Mid Ch								
836.50	15.57	V	3.9	1.1	12.80	38.5	-25.7	
836.50	22.48	H	3.9	0.6	19.21	38.5	-19.3	
High Ch								
839.00	16.10	V	3.9	1.1	13.32	38.5	-25.2	
839.00	22.44	H	3.9	0.6	19.16	38.5	-19.3	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_16QAM 20 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
834.00	15.80	V	3.9	1.1	13.04	38.5	-25.5	
834.00	21.82	H	3.9	0.6	18.56	38.5	-19.9	
Mid Ch								
836.50	13.29	V	3.9	1.1	10.52	38.5	-28.0	
836.50	21.37	H	3.9	0.6	18.10	38.5	-20.4	
High Ch								
839.00	13.25	V	3.9	1.1	10.47	38.5	-28.0	
839.00	21.95	H	3.9	0.6	18.67	38.5	-19.8	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_QPSK 15 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	13.95	V	3.9	1.1	11.20	38.5	-27.3	
831.50	22.73	H	3.9	0.6	19.48	38.5	-19.0	
Mid Ch								
836.50	14.88	V	3.9	1.1	12.11	38.5	-26.4	
836.50	22.23	H	3.9	0.6	18.96	38.5	-19.5	
High Ch								
841.50	13.76	V	3.9	1.1	10.97	38.5	-27.5	
841.50	22.79	H	3.9	0.6	19.50	38.5	-19.0	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_16QAM 15 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	15.87	V	3.9	1.1	13.12	38.5	-25.4	
831.50	21.65	H	3.9	0.6	18.40	38.5	-20.1	
Mid Ch								
836.50	14.73	V	3.9	1.1	11.96	38.5	-26.5	
836.50	21.20	H	3.9	0.6	17.93	38.5	-20.6	
High Ch								
841.50	14.46	V	3.9	1.1	11.67	38.5	-26.8	
841.50	21.65	H	3.9	0.6	18.36	38.5	-20.1	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/23/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_QPSK 10 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	15.62	V	3.8	1.1	12.87	38.5	-25.6	
829.00	22.47	H	3.8	0.6	19.22	38.5	-19.3	
Mid Ch								
836.50	13.97	V	3.9	1.1	11.20	38.5	-27.3	
836.50	23.25	H	3.9	0.6	19.98	38.5	-18.5	
High Ch								
844.00	14.20	V	3.9	1.1	11.40	38.5	-27.1	
844.00	22.30	H	3.9	0.6	19.00	38.5	-19.5	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/23/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_16QAM 10 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	14.42	V	3.8	1.1	11.67	38.5	-26.8	
829.00	22.14	H	3.8	0.6	18.89	38.5	-19.6	
Mid Ch								
836.50	12.77	V	3.9	1.1	10.00	38.5	-28.5	
836.50	21.86	H	3.9	0.6	18.59	38.5	-19.9	
High Ch								
844.00	12.97	V	3.9	1.1	10.17	38.5	-28.3	
844.00	21.15	H	3.9	0.6	17.85	38.5	-20.6	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: 32595
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_QPSK 5 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	14.23	V	2.7	1.1	12.64	38.5	-25.9	
826.50	21.31	H	2.7	0.6	19.22	38.5	-19.3	
Mid Ch								
836.50	13.62	V	2.7	1.1	12.02	38.5	-26.5	
836.50	21.56	H	2.7	0.6	19.46	38.5	-19.0	
High Ch								
846.50	12.48	V	2.7	1.1	10.84	38.5	-27.7	
846.50	21.56	H	2.7	0.6	19.42	38.5	-19.1	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: 32595
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N5_16QAM 5 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	15.05	V	2.7	1.1	13.46	38.5	-25.0	
826.50	20.18	H	2.7	0.6	18.09	38.5	-20.4	
Mid Ch								
836.50	13.85	V	2.7	1.1	12.25	38.5	-26.2	
836.50	20.25	H	2.7	0.6	18.15	38.5	-20.3	
High Ch								
846.50	14.18	V	2.7	1.1	12.54	38.5	-26.0	
846.50	20.37	H	2.7	0.6	18.23	38.5	-20.3	

10.1.2. 5G NR n26(90s)

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N26(90S)_QPSK 20 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235174, and 03-RDE-C SMA Cables
Substitution: Dipole 808005, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
High Ch								
824.00	17.41	V	2.7	1.1	15.83	38.5	-22.7	
824.00	23.13	H	2.7	0.6	21.04	38.5	-17.5	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N26(90S)_16QAM 20 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235174, and 03-RDE-C SMA Cables
Substitution: Dipole 808005, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
High Ch								
824.00	16.15	V	2.7	1.1	14.57	38.5	-23.9	
824.00	21.97	H	2.7	0.6	19.88	38.5	-18.6	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(90S)_QPSK 15 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
821.50	17.65	V	3.8	1.1	14.94	38.5	-23.6	
821.50	23.25	H	3.8	0.6	20.01	38.5	-18.5	
High Ch								
824.00	17.26	V	3.8	1.1	14.53	38.5	-24.0	
824.00	23.40	H	3.8	0.6	20.16	38.5	-18.3	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(90S)_16QAM 15 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
821.50	16.43	V	3.8	1.1	13.72	38.5	-24.8	
821.50	21.96	H	3.8	0.6	18.72	38.5	-19.8	
High Ch								
824.00	16.11	V	3.8	1.1	13.38	38.5	-25.1	
824.00	22.18	H	3.8	0.6	18.94	38.5	-19.6	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(90S)_QPSK 10 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
819.00	17.63	V	3.8	1.1	14.93	38.5	-23.6	
819.00	22.80	H	3.8	0.6	19.55	38.5	-18.9	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(90S)_16QAM 10 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
819.00	16.46	V	3.8	1.1	13.76	38.5	-24.7	
819.00	21.58	H	3.8	0.6	18.33	38.5	-20.2	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(90S)_QPSK 5 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	17.50	V	3.8	1.1	14.82	38.5	-23.7	
816.50	22.03	H	3.8	0.6	18.78	38.5	-19.7	
Mid Ch								
819.00	17.55	V	3.8	1.1	14.85	38.5	-23.6	
819.00	22.90	H	3.8	0.6	19.65	38.5	-18.8	
High Ch								
821.50	15.90	V	3.8	1.1	13.19	38.5	-25.3	
821.50	22.76	H	3.8	0.6	19.52	38.5	-19.0	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(90S)_16QAM 5 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	16.29	V	3.8	1.1	13.61	38.5	-24.9	
816.50	19.76	H	3.8	0.6	16.51	38.5	-22.0	
Mid Ch								
819.00	16.27	V	3.8	1.1	13.57	38.5	-24.9	
819.00	21.71	H	3.8	0.6	18.46	38.5	-20.0	
High Ch								
821.50	13.66	V	3.8	1.1	10.95	38.5	-27.6	
821.50	20.46	H	3.8	0.6	17.22	38.5	-21.3	

10.1.3. 5G NR n26(22H)

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N26(Part22)_QPSK 20 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235174, and 03-RDE-C SMA Cables
Substitution: Dipole 808005, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
834.00	15.79	V	2.7	1.1	14.19	38.5	-24.3	
834.00	22.77	H	2.7	0.6	20.67	38.5	-17.8	
Mid Ch								
836.50	15.52	V	2.7	1.1	13.92	38.5	-24.6	
836.50	22.72	H	2.7	0.6	20.62	38.5	-17.9	
High Ch								
839.00	15.97	V	2.7	1.1	14.36	38.5	-24.1	
839.00	22.42	H	2.7	0.6	20.31	38.5	-18.2	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N26(Part22)_16QAM 20 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235174, and 03-RDE-C SMA Cables
Substitution: Dipole 808005, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
834.00	15.56	V	2.7	1.1	13.96	38.5	-24.5	
834.00	21.53	H	2.7	0.6	19.43	38.5	-19.1	
Mid Ch								
836.50	15.29	V	2.7	1.1	13.69	38.5	-24.8	
836.50	21.47	H	2.7	0.6	19.37	38.5	-19.1	
High Ch								
839.00	14.70	V	2.7	1.1	13.09	38.5	-25.4	
839.00	21.18	H	2.7	0.6	19.07	38.5	-19.4	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N26(Part22)_QPSK 15 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235174, and 03-RDE-C SMA Cables
Substitution: Dipole 808005, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	16.73	V	2.7	1.1	15.14	38.5	-23.4	
831.50	22.90	H	2.7	0.6	20.81	38.5	-17.7	
Mid Ch								
836.50	14.22	V	2.7	1.1	12.62	38.5	-25.9	
836.50	23.00	H	2.7	0.6	20.90	38.5	-17.6	
High Ch								
841.50	14.22	V	2.7	1.1	12.60	38.5	-25.9	
841.50	22.60	H	2.7	0.6	20.48	38.5	-18.0	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N26(Part22)_16QAM 15 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235174, and 03-RDE-C SMA Cables
Substitution: Dipole 808005, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	15.56	V	2.7	1.1	13.97	38.5	-24.5	
831.50	21.65	H	2.7	0.6	19.56	38.5	-18.9	
Mid Ch								
836.50	11.98	V	2.7	1.1	10.38	38.5	-28.1	
836.50	21.81	H	2.7	0.6	19.71	38.5	-18.8	
High Ch								
841.50	11.98	V	2.7	1.1	10.36	38.5	-28.1	
841.50	21.45	H	2.7	0.6	19.33	38.5	-19.2	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(Part22)_QPSK 10 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	15.67	V	2.7	1.1	14.08	38.5	-24.4	
829.00	22.80	H	2.7	0.6	20.71	38.5	-17.8	
Mid Ch								
836.50	16.40	V	2.7	1.1	14.80	38.5	-23.7	
836.50	22.78	H	2.7	0.6	20.68	38.5	-17.8	
High Ch								
844.00	16.37	V	2.7	1.1	14.74	38.5	-23.8	
844.00	21.98	H	2.7	0.6	19.85	38.5	-18.6	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(Part22)_16QAM 10 MHz Fundamentals

Test Equipment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	14.36	V	2.7	1.1	12.77	38.5	-25.7	
829.00	21.53	H	2.7	0.6	19.44	38.5	-19.1	
Mid Ch								
836.50	15.14	V	2.7	1.1	13.54	38.5	-25.0	
836.50	21.52	H	2.7	0.6	19.42	38.5	-19.1	
High Ch								
844.00	15.12	V	2.7	1.1	13.49	38.5	-25.0	
844.00	20.70	H	2.7	0.6	18.57	38.5	-19.9	

5MHz QPSK

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(Part22)_QPSK 5 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	17.18	V	2.7	1.1	15.59	38.5	-22.9	
826.50	23.06	H	2.7	0.6	20.97	38.5	-17.5	
Mid Ch								
836.50	16.28	V	2.7	1.1	14.68	38.5	-23.8	
836.50	22.62	H	2.7	0.6	20.52	38.5	-18.0	
High Ch								
846.50	16.88	V	2.7	1.1	15.24	38.5	-23.3	
846.50	22.99	H	2.7	0.6	20.85	38.5	-17.6	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N26(Part22)_16QAM 5 MHz Fundamentals

Test Equpment:
Receiving: Hybrid 235173, and 03-RDE-A SMA Cables
Substitution: Dipole 808005, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	15.96	V	2.7	1.1	14.37	38.5	-24.1	
826.50	21.86	H	2.7	0.6	19.77	38.5	-18.7	
Mid Ch								
836.50	15.17	V	2.7	1.1	13.57	38.5	-24.9	
836.50	21.38	H	2.7	0.6	19.28	38.5	-19.2	
High Ch								
846.50	15.67	V	2.7	1.1	14.03	38.5	-24.5	
846.50	21.65	H	2.7	0.6	19.51	38.5	-19.0	

10.1.4. 5G NR n41

100MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/9/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 100MHz Fundamental

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2546.00	12.25	V	6.1	6.1	12.21	33.0	-20.8	
2546.00	22.98	H	6.1	6.1	22.94	33.0	-10.1	
Mid Ch								
2593.00	11.90	V	6.3	6.2	11.80	33.0	-21.2	
2593.00	22.91	H	6.3	6.2	22.81	33.0	-10.2	
High Ch								
2640.00	12.14	V	6.4	6.3	12.08	33.0	-20.9	
2640.00	20.40	H	6.4	6.3	20.34	33.0	-12.7	

100MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/9/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 100 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2546.00	11.96	V	6.1	6.1	11.92	33.0	-21.1	
2546.00	21.23	H	6.1	6.1	21.19	33.0	-11.8	
Mid Ch								
2593.00	11.85	V	6.3	6.2	11.75	33.0	-21.3	
2593.00	21.11	H	6.3	6.2	21.01	33.0	-12.0	
High Ch								
2640.00	11.68	V	6.4	6.3	11.62	33.0	-21.4	
2640.00	19.77	H	6.4	6.3	19.71	33.0	-13.3	

90MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2536.00	10.88	V	6.1	6.1	10.85	33.0	-22.2	
2536.00	20.93	H	6.1	6.1	20.90	33.0	-12.1	
Mid Ch								
2592.99	11.86	V	6.3	6.2	11.76	33.0	-21.2	
2592.99	22.02	H	6.3	6.2	21.92	33.0	-11.1	
High Ch								
2650.00	12.76	V	6.4	6.4	12.73	33.0	-20.3	
2650.00	20.85	H	6.4	6.4	20.82	33.0	-12.2	

90MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 12491 GM
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2536.00	11.89	V	6.1	6.1	11.86	33.0	-21.1	
2536.00	19.59	H	6.1	6.1	19.56	33.0	-13.4	
Mid Ch								
2593.00	12.51	V	6.3	6.2	12.41	33.0	-20.6	
2593.00	20.14	H	6.3	6.2	20.04	33.0	-13.0	
High Ch								
2650.00	7.89	V	6.4	6.4	7.86	33.0	-25.1	
2650.00	20.45	H	6.4	6.4	20.42	33.0	-12.6	

80MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2536.00	5.88	V	6.1	6.1	5.85	33.0	-27.2	
2536.00	18.93	H	6.1	6.1	18.90	33.0	-14.1	
Mid Ch								
2592.99	11.86	V	6.3	6.2	11.76	33.0	-21.2	
2592.99	22.02	H	6.3	6.2	21.92	33.0	-11.1	
High Ch								
2650.00	7.76	V	6.4	6.4	7.73	33.0	-25.3	
2650.00	20.85	H	6.4	6.4	20.82	33.0	-12.2	

80MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 12491 GM
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2536.00	11.89	V	6.1	6.1	11.86	33.0	-21.1	
2536.00	18.59	H	6.1	6.1	18.56	33.0	-14.4	
Mid Ch								
2593.00	12.51	V	6.3	6.2	12.41	33.0	-20.6	
2593.00	22.14	H	6.3	6.2	22.04	33.0	-11.0	
High Ch								
2650.00	7.89	V	6.4	6.4	7.86	33.0	-25.1	
2650.00	20.45	H	6.4	6.4	20.42	33.0	-12.6	

70MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 70 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2631.01	13.58	V	6.4	6.3	13.49	33.0	-19.5	
2631.01	21.36	H	6.4	6.3	21.27	33.0	-11.7	
Mid Ch								
2592.99	9.99	V	6.3	6.2	9.89	33.0	-23.1	
2592.99	22.00	H	6.3	6.2	21.90	33.0	-11.1	
High Ch								
2655.00	13.15	V	6.4	6.4	13.13	33.0	-19.9	
2655.00	19.52	H	6.4	6.4	19.50	33.0	-13.5	

70MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 70 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2631.01	12.94	V	6.4	6.3	12.85	33.0	-20.1	
2631.01	19.34	H	6.4	6.3	19.25	33.0	-13.7	
Mid Ch								
2592.99	18.17	V	6.3	6.2	18.07	33.0	-14.9	
2592.99	20.83	H	6.3	6.2	20.73	33.0	-12.3	
High Ch								
2655.00	12.87	V	6.4	6.4	12.85	33.0	-20.1	
2655.00	18.88	H	6.4	6.4	18.86	33.0	-14.1	

60MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 60 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2526.00	17.67	V	6.1	6.0	17.64	33.0	-15.4	
2526.00	18.82	H	6.1	6.0	18.79	33.0	-14.2	
Mid Ch								
2592.99	16.34	V	6.3	6.2	16.24	33.0	-16.8	
2592.99	21.34	H	6.3	6.2	21.24	33.0	-11.8	
High Ch								
2660.00	19.48	V	6.4	6.4	19.47	33.0	-13.5	
2660.00	22.59	H	6.4	6.4	22.58	33.0	-10.4	

60MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 12491 GM
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 60 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2526.00	7.24	V	6.1	6.0	7.21	33.0	-25.8	
2526.00	18.41	H	6.1	6.0	18.38	33.0	-14.6	
Mid Ch								
2593.00	7.39	V	6.3	6.2	7.29	33.0	-25.7	
2593.00	20.66	H	6.3	6.2	20.56	33.0	-12.4	
High Ch								
2660.00	6.41	V	6.4	6.4	6.40	33.0	-26.6	
2660.00	20.53	H	6.4	6.4	20.52	33.0	-12.5	

50MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 50 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2512.02	8.87	V	6.0	6.0	8.84	33.0	-24.2	
2512.02	20.66	H	6.0	6.0	20.63	33.0	-12.4	
Mid Ch								
2592.99	15.30	V	6.3	6.2	15.20	33.0	-17.8	
2592.99	21.18	H	6.3	6.2	21.08	33.0	-11.9	
High Ch								
2665.00	16.04	V	6.4	6.4	16.04	33.0	-17.0	
2665.00	21.38	H	6.4	6.4	21.38	33.0	-11.6	

50MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 12491 GM
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 50 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2521.00	7.53	V	6.0	6.0	7.50	33.0	-25.5	
2521.00	18.41	H	6.0	6.0	18.38	33.0	-14.6	
Mid Ch								
2593.00	9.39	V	6.3	6.2	9.29	33.0	-23.7	
2593.00	20.90	H	6.3	6.2	20.80	33.0	-12.2	
High Ch								
2665.00	9.46	V	6.4	6.4	9.46	33.0	-23.5	
2665.00	20.73	H	6.4	6.4	20.73	33.0	-12.3	

40MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 40 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2516.00	17.33	V	6.0	6.0	17.30	33.0	-15.7	
2516.00	19.33	H	6.0	6.0	19.30	33.0	-13.7	
Mid Ch								
2592.99	7.46	V	6.3	6.2	7.36	33.0	-25.6	
2592.99	20.49	H	6.3	6.2	20.39	33.0	-12.6	
High Ch								
2670.00	9.64	V	6.4	6.4	9.64	33.0	-23.4	
2670.00	20.59	H	6.4	6.4	20.59	33.0	-12.4	

40MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 12491 GM
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 40 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2516.00	7.97	V	6.0	6.0	7.94	33.0	-25.1	
2516.00	18.86	H	6.0	6.0	18.83	33.0	-14.2	
Mid Ch								
2593.00	7.84	V	6.3	6.2	7.74	33.0	-25.3	
2593.00	19.76	H	6.3	6.2	19.66	33.0	-13.3	
High Ch								
2670.00	8.30	V	6.4	6.4	8.30	33.0	-24.7	
2670.00	19.87	H	6.4	6.4	19.87	33.0	-13.1	

30MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 30 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2511.00	6.96	V	6.0	6.0	6.93	33.0	-26.1	
2511.00	18.69	H	6.0	6.0	18.66	33.0	-14.3	
Mid Ch								
2592.99	9.61	V	6.3	6.2	9.51	33.0	-23.5	
2592.99	21.58	H	6.3	6.2	21.48	33.0	-11.5	
High Ch								
2675.00	9.49	V	6.4	6.4	9.50	33.0	-23.5	
2675.00	21.04	H	6.4	6.4	21.05	33.0	-12.0	

30MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 12491 GM
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 30 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2511.00	3.24	V	6.0	6.0	3.21	33.0	-29.8	
2511.00	17.15	H	6.0	6.0	17.12	33.0	-15.9	
Mid Ch								
2593.00	13.56	V	6.3	6.2	13.46	33.0	-19.5	
2593.00	20.58	H	6.3	6.2	20.48	33.0	-12.5	
High Ch								
2675.00	6.10	V	6.4	6.4	6.11	33.0	-26.9	
2675.00	20.13	H	6.4	6.4	20.14	33.0	-12.9	

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 20 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	8.88	V	6.0	6.0	8.86	33.0	-24.1	
2506.00	18.48	H	6.0	6.0	18.46	33.0	-14.5	
Mid Ch								
2592.99	16.72	V	6.3	6.2	16.62	33.0	-16.4	
2592.99	19.75	H	6.3	6.2	19.65	33.0	-13.3	
High Ch								
2680.00	9.70	V	6.4	6.4	9.71	33.0	-23.3	
2680.00	19.69	H	6.4	6.4	19.70	33.0	-13.3	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/11/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 20 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	13.93	V	6.0	6.0	13.91	33.0	-19.1	
2506.00	17.36	H	6.0	6.0	17.34	33.0	-15.7	
Mid Ch								
2593.00	18.01	V	6.3	6.2	17.91	33.0	-15.1	
2593.00	18.92	H	6.3	6.2	18.82	33.0	-14.2	
High Ch								
2680.00	8.86	V	6.4	6.4	8.87	33.0	-24.1	
2680.00	19.07	H	6.4	6.4	19.08	33.0	-13.9	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/12/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 15 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	14.42	V	6.0	6.0	14.39	33.0	-18.6	
2503.50	21.03	H	6.0	6.0	21.00	33.0	-12.0	
Mid Ch								
2592.99	14.52	V	6.3	6.2	14.42	33.0	-18.6	
2592.99	21.38	H	6.3	6.2	21.28	33.0	-11.7	
High Ch								
2637.75	13.35	V	6.4	6.3	13.29	33.0	-19.7	
2637.75	21.17	H	6.4	6.3	21.11	33.0	-11.9	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lion
Project #: 14938215 (SM-A256E_DSN)
Date: 10/12/2023
Test Engineer: 50820 EC
Configuration: EUT ONLY
Location: 03-RDE-C
Mode: FR1_N41_16QAM 15 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	15.08	V	6.0	6.0	15.05	33.0	-17.9	
2503.50	19.44	H	6.0	6.0	19.41	33.0	-13.6	
Mid Ch								
2593.00	14.57	V	6.3	6.2	14.47	33.0	-18.5	
2593.00	19.46	H	6.3	6.2	19.36	33.0	-13.6	
High Ch								
2637.75	14.03	V	6.4	6.3	13.97	33.0	-19.0	
2637.75	20.26	H	6.4	6.3	20.20	33.0	-12.8	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lion
Project #: 14938215 (SM-A256E_DSN)
Date: 10/12/2023
Test Engineer: 50820
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_QPSK 10 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.10	16.12	V	6.0	6.0	16.09	33.0	-16.9	
2501.10	20.73	H	6.0	6.0	20.70	33.0	-12.3	
Mid Ch								
2592.99	15.33	V	6.3	6.2	15.23	33.0	-17.8	
2592.99	21.32	H	6.3	6.2	21.22	33.0	-11.8	
High Ch								
2639.01	14.36	V	6.4	6.3	14.30	33.0	-18.7	
2639.01	20.56	H	6.4	6.3	20.50	33.0	-12.5	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lion
Project #: 14938215 (SM-A256E_DSN)
Date: 10/12/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N41_16QAM 10 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.10	15.14	V	6.0	6.0	15.11	33.0	-17.9	
2501.10	19.64	H	6.0	6.0	19.61	33.0	-13.4	
Mid Ch								
2593.00	14.09	V	6.3	6.2	13.99	33.0	-19.0	
2593.00	20.02	H	6.3	6.2	19.92	33.0	-13.1	
High Ch								
2639.01	13.86	V	6.4	6.3	13.80	33.0	-19.2	
2639.01	19.25	H	6.4	6.3	19.19	33.0	-13.8	

10.1.5. 5G NR n66

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_QPSK 20 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	18.52	V	6.3	5.5	17.77	30.0	-12.2	
1720.00	14.34	H	6.3	5.5	13.59	30.0	-16.4	
Mid Ch								
1745.00	17.60	V	6.3	5.3	16.57	30.0	-13.4	
1745.00	16.49	H	6.3	5.3	15.46	30.0	-14.5	
High Ch								
1770.00	19.06	V	6.4	5.1	17.84	30.0	-12.2	
1770.00	16.06	H	6.4	5.1	14.84	30.0	-15.2	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_16QAM 20 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	16.01	V	6.3	5.5	15.26	30.0	-14.7	
1720.00	13.37	H	6.3	5.5	12.62	30.0	-17.4	
Mid Ch								
1745.00	16.60	V	6.3	5.3	15.57	30.0	-14.4	
1745.00	14.01	H	6.3	5.3	12.98	30.0	-17.0	
High Ch								
1770.00	16.52	V	6.4	5.1	15.30	30.0	-14.7	
1770.00	13.62	H	6.4	5.1	12.40	30.0	-17.6	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_QPSK 15 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	17.46	V	6.3	5.5	16.74	30.0	-13.3	
1717.50	14.13	H	6.3	5.5	13.41	30.0	-16.6	
Mid Ch								
1745.00	17.24	V	6.3	5.3	16.21	30.0	-13.8	
1745.00	14.24	H	6.3	5.3	13.21	30.0	-16.8	
High Ch								
1772.50	18.98	V	6.4	5.1	17.74	30.0	-12.3	
1772.50	16.08	H	6.4	5.1	14.84	30.0	-15.2	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2023
Test Engineer: 32990 JS
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_16QAM 15 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	16.49	V	6.3	5.5	15.77	30.0	-14.2	
1717.50	13.12	H	6.3	5.5	12.40	30.0	-17.6	
Mid Ch								
1745.00	16.35	V	6.3	5.3	15.32	30.0	-14.7	
1745.00	13.26	H	6.3	5.3	12.23	30.0	-17.8	
High Ch								
1772.50	17.89	V	6.4	5.1	16.65	30.0	-13.4	
1772.50	15.97	H	6.4	5.1	14.73	30.0	-15.3	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2026
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_QPSK 10 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	17.99	V	6.3	5.6	17.29	30.0	-12.7	
1715.00	15.29	H	6.3	5.6	14.59	30.0	-15.4	
Mid Ch								
1745.00	18.16	V	6.3	5.3	17.13	30.0	-12.9	
1745.00	16.45	H	6.3	5.3	15.42	30.0	-14.6	
High Ch								
1775.00	18.13	V	6.4	5.1	16.87	30.0	-13.1	
1775.00	15.37	H	6.4	5.1	14.11	30.0	-15.9	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2026
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_16QAM 10 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	16.98	V	6.3	5.6	16.28	30.0	-13.7	
1715.00	14.21	H	6.3	5.6	13.51	30.0	-16.5	
Mid Ch								
1745.00	17.04	V	6.3	5.3	16.01	30.0	-14.0	
1745.00	16.11	H	6.3	5.3	15.08	30.0	-14.9	
High Ch								
1775.00	17.09	V	6.4	5.1	15.83	30.0	-14.2	
1775.00	14.30	H	6.4	5.1	13.04	30.0	-17.0	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_QPSK 5 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	18.13	V	6.3	5.6	17.46	30.0	-12.5	
1712.50	16.72	H	6.3	5.6	16.05	30.0	-14.0	
Mid Ch								
1745.00	18.89	V	6.3	5.3	17.86	30.0	-12.1	
1745.00	16.87	H	6.3	5.3	15.84	30.0	-14.2	
High Ch								
1777.50	18.65	V	6.4	5.1	17.37	30.0	-12.6	
1777.50	17.32	H	6.4	5.1	16.04	30.0	-14.0	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/26/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-A
Mode: FR1_N66_16QAM 5 MHz Fundamentals

Test Equipment:
Receiving: Horn 200897, and 03-RDE-A SMA Cables
Substitution: Horn 200785, 03-RDE-A Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	17.14	V	6.3	5.6	16.47	30.0	-13.5	
1712.50	16.23	H	6.3	5.6	15.56	30.0	-14.4	
Mid Ch								
1745.00	17.75	V	6.3	5.3	16.72	30.0	-13.3	
1745.00	15.79	H	6.3	5.3	14.76	30.0	-15.2	
High Ch								
1777.50	17.64	V	6.4	5.1	16.36	30.0	-13.6	
1777.50	16.25	H	6.4	5.1	14.97	30.0	-15.0	

10.1.6. 5G NR n77 (Part 27 3450-3550MHz)

100MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/18/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 100 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
Mid Ch								
3500.01	21.00	V	7.3	8.3	22.05	30.0	-7.9	
3500.01	22.89	H	7.3	8.3	23.94	30.0	-6.1	
High Ch								

100MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/18/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 100 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
Mid Ch								
3500.01	19.77	V	7.3	8.3	20.82	30.0	-9.2	
3500.01	21.10	H	7.3	8.3	22.15	30.0	-7.8	
High Ch								

90MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215(SM-A256E_DSN)
Date: 10/18/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 90 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	20.07	V	7.3	8.3	21.12	30.0	-8.9	
3500.01	22.19	H	7.3	8.3	23.24	30.0	-6.8	

90MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215(SM-A256E_DSN)
Date: 10/18/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 90 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	19.77	V	7.3	8.3	20.82	30.0	-9.2	
3500.01	21.15	H	7.3	8.3	22.20	30.0	-7.8	

80MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215(SM-A256E_DSN)
Date: 10/18/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	20.47	V	7.3	8.3	21.52	30.0	-8.5	
3500.01	21.85	H	7.3	8.3	22.90	30.0	-7.1	

80MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215(SM-A256E_DSN)
Date: 10/18/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	19.94	V	7.3	8.3	20.99	30.0	-9.0	
3500.01	20.87	H	7.3	8.3	21.92	30.0	-8.1	

70MHz QPSK

70MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 70 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	20.90	V	7.3	8.3	21.95	30.0	-8.0	
3500.01	22.08	H	7.3	8.3	23.13	30.0	-6.9	

60MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 70 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	20.37	V	7.3	8.3	21.42	30.0	-8.6	
3500.01	20.67	H	7.3	8.3	21.72	30.0	-8.3	

60MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 60 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	20.99	V	7.3	8.3	22.04	30.0	-8.0	
3500.01	22.27	H	7.3	8.3	23.32	30.0	-6.7	

50MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 60 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
3500.01	20.37	V	7.3	8.3	21.42	30.0	-8.6	
3500.01	21.10	H	7.3	8.3	22.15	30.0	-7.8	

50MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 50 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3475.02	18.39	V	7.3	8.3	19.39	30.0	-10.6	
3475.02	19.91	H	7.3	8.3	20.91	30.0	-9.1	
High Ch								
3525.00	18.75	V	7.3	8.4	19.82	30.0	-10.2	
3525.00	20.04	H	7.3	8.4	21.11	30.0	-8.9	

40MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 50 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3475.02	17.54	V	7.3	8.3	18.54	30.0	-11.5	
3475.02	18.85	H	7.3	8.3	19.85	30.0	-10.1	
High Ch								
3525.00	17.14	V	7.3	8.4	18.21	30.0	-11.8	
3525.00	19.08	H	7.3	8.4	20.15	30.0	-9.8	

40MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 40 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3470.01	18.79	V	7.3	8.3	19.79	30.0	-10.2	
3470.01	20.62	H	7.3	8.3	21.62	30.0	-8.4	
Mid Ch								
3500.01	21.13	V	7.3	8.3	22.18	30.0	-7.8	
3500.01	22.60	H	7.3	8.3	23.65	30.0	-6.3	
High Ch								
3529.98	20.15	V	7.3	8.4	21.22	30.0	-8.8	
3529.98	21.16	H	7.3	8.4	22.23	30.0	-7.8	

30MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 40 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3470.01	18.10	V	7.3	8.3	19.10	30.0	-10.9	
3470.01	19.90	H	7.3	8.3	20.90	30.0	-9.1	
Mid Ch								
3500.01	20.27	V	7.3	8.3	21.32	30.0	-8.7	
3500.01	21.71	H	7.3	8.3	22.76	30.0	-7.2	
High Ch								
3529.98	19.58	V	7.3	8.4	20.65	30.0	-9.4	
3529.98	20.31	H	7.3	8.4	21.38	30.0	-8.6	

30MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 30 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	18.80	V	7.3	8.3	19.80	30.0	-10.2	
3465.00	20.22	H	7.3	8.3	21.22	30.0	-8.8	
Mid Ch								
3500.01	21.05	V	7.3	8.3	22.10	30.0	-7.9	
3500.01	22.43	H	7.3	8.3	23.48	30.0	-6.5	
High Ch								
3534.99	20.02	V	7.3	8.4	21.07	30.0	-8.9	
3534.99	21.04	H	7.3	8.4	22.09	30.0	-7.9	

25MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 30 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	17.50	V	7.3	8.3	18.50	30.0	-11.5	
3465.00	19.45	H	7.3	8.3	20.45	30.0	-9.6	
Mid Ch								
3500.01	20.51	V	7.3	8.3	21.56	30.0	-8.4	
3500.01	21.33	H	7.3	8.3	22.38	30.0	-7.6	
High Ch								
3534.99	19.16	V	7.3	8.4	20.21	30.0	-9.8	
3534.99	20.55	H	7.3	8.4	21.60	30.0	-8.4	

25MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 25 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3462.99	18.61	V	7.3	8.2	19.61	30.0	-10.4	
3462.99	20.07	H	7.3	8.2	21.07	30.0	-8.9	
Mid Ch								
3500.01	20.65	V	7.3	8.3	21.70	30.0	-8.3	
3500.01	22.35	H	7.3	8.3	23.40	30.0	-6.6	
High Ch								
3537.00	19.52	V	7.3	8.4	20.55	30.0	-9.4	
3537.00	20.65	H	7.3	8.4	21.68	30.0	-8.3	

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 25 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3462.99	18.46	V	7.3	8.2	19.46	30.0	-10.5	
3462.99	19.45	H	7.3	8.2	20.45	30.0	-9.6	
Mid Ch								
3500.01	19.51	V	7.3	8.3	20.56	30.0	-9.4	
3500.01	21.60	H	7.3	8.3	22.65	30.0	-7.3	
High Ch								
3537.00	18.96	V	7.3	8.4	19.99	30.0	-10.0	
3537.00	19.99	H	7.3	8.4	21.02	30.0	-9.0	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 20 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3460.02	18.33	V	7.3	8.2	19.32	30.0	-10.7	
3460.02	19.67	H	7.3	8.2	20.66	30.0	-9.3	
Mid Ch								
3500.01	20.15	V	7.3	8.3	21.20	30.0	-8.8	
3500.01	20.88	H	7.3	8.3	21.93	30.0	-8.1	
High Ch								
3540.00	19.27	V	7.4	8.4	20.28	30.0	-9.7	
3540.00	21.03	H	7.4	8.4	22.04	30.0	-8.0	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 20 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3460.02	17.98	V	7.3	8.2	18.97	30.0	-11.0	
3460.02	19.26	H	7.3	8.2	20.25	30.0	-9.7	
Mid Ch								
3500.01	19.16	V	7.3	8.3	20.21	30.0	-9.8	
3500.01	20.75	H	7.3	8.3	21.80	30.0	-8.2	
High Ch								
3540.00	18.72	V	7.4	8.4	19.73	30.0	-10.3	
3540.00	20.40	H	7.4	8.4	21.41	30.0	-8.6	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 15 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	18.48	V	7.2	8.2	19.47	30.0	-10.5	
3457.50	22.46	H	7.2	8.2	23.45	30.0	-6.5	
Mid Ch								
3500.01	20.41	V	7.3	8.3	21.46	30.0	-8.5	
3500.01	21.22	H	7.3	8.3	22.27	30.0	-7.7	
High Ch								
3542.49	19.13	V	7.4	8.4	20.13	30.0	-9.9	
3542.49	21.07	H	7.4	8.4	22.07	30.0	-7.9	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 15 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	18.40	V	7.2	8.2	19.39	30.0	-10.6	
3457.50	20.91	H	7.2	8.2	21.90	30.0	-8.1	
Mid Ch								
3500.01	17.96	V	7.3	8.3	19.01	30.0	-11.0	
3500.01	19.07	H	7.3	8.3	20.12	30.0	-9.9	
High Ch								
3542.49	18.61	V	7.4	8.4	19.61	30.0	-10.4	
3542.49	20.35	H	7.4	8.4	21.35	30.0	-8.6	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_QPSK 10 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3455.01	17.65	V	7.2	8.2	18.64	30.0	-11.4	
3455.01	20.49	H	7.2	8.2	21.48	30.0	-8.5	
Mid Ch								
3500.01	18.07	V	7.3	8.3	19.12	30.0	-10.9	
3500.01	20.84	H	7.3	8.3	21.89	30.0	-8.1	
High Ch								
3544.98	18.37	V	7.4	8.4	19.36	30.0	-10.6	
3544.98	20.07	H	7.4	8.4	21.06	30.0	-8.9	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/19/2023
Test Engineer: 32595 RT
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77a_16QAM 10 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3455.01	16.06	V	7.2	8.2	17.05	30.0	-13.0	
3455.01	19.91	H	7.2	8.2	20.90	30.0	-9.1	
Mid Ch								
3500.01	17.56	V	7.3	8.3	18.61	30.0	-11.4	
3500.01	18.20	H	7.3	8.3	19.25	30.0	-10.7	
High Ch								
3544.98	17.07	V	7.4	8.4	18.06	30.0	-11.9	
3544.98	18.60	H	7.4	8.4	19.59	30.0	-10.4	

10.1.7. 5G NR n77 (Part 27 3700-3980MHz)

100MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20*/23
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 100 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	19.48	V	7.8	8.5	20.19	30.0	-9.8	
3750.00	22.23	H	7.8	8.5	22.94	30.0	-7.1	
High Ch								
3930.00	19.35	V	8.2	8.6	19.80	30.0	-10.2	
3930.00	22.44	H	8.2	8.6	22.89	30.0	-7.1	

100MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20*/23
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 100 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	18.02	V	7.8	8.5	18.73	30.0	-11.3	
3750.00	21.12	H	7.8	8.5	21.83	30.0	-8.2	
High Ch								
3930.00	18.25	V	8.2	8.6	18.70	30.0	-11.3	
3930.00	20.97	H	8.2	8.6	21.42	30.0	-8.6	

90MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 50820 EC
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 90 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3745.02	18.53	V	7.8	8.5	19.26	30.0	-10.7	
3745.02	21.65	H	7.8	8.5	22.38	30.0	-7.6	
Mid Ch								
3840.00	19.48	V	8.0	8.5	19.96	30.0	-10.0	
3840.00	22.21	H	8.0	8.5	22.69	30.0	-7.3	
High Ch								
3934.98	18.01	V	8.2	8.6	18.48	30.0	-11.5	
3934.98	22.29	H	8.2	8.6	22.76	30.0	-7.2	

90MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 90 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3745.02	16.96	V	7.8	8.5	17.69	30.0	-12.3	
3745.02	20.24	H	7.8	8.5	20.97	30.0	-9.0	
Mid Ch								
3840.00	16.75	V	8.0	8.5	17.23	30.0	-12.8	
3840.00	20.25	H	8.0	8.5	20.73	30.0	-9.3	
High Ch								
3934.98	17.19	V	8.2	8.6	17.66	30.0	-12.3	
3934.98	20.06	H	8.2	8.6	20.53	30.0	-9.5	

80MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3740.01	18.74	V	7.8	8.5	19.49	30.0	-10.5	
3740.01	21.75	H	7.8	8.5	22.50	30.0	-7.5	
Mid Ch								
3840.00	19.97	V	8.0	8.5	20.45	30.0	-9.6	
3840.00	21.97	H	8.0	8.5	22.45	30.0	-7.6	
High Ch								
3939.99	17.91	V	8.2	8.7	18.39	30.0	-11.6	
3939.99	21.95	H	8.2	8.7	22.43	30.0	-7.6	

80MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 80 MHz Fundamentals

Test Equipment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3740.01	18.34	V	7.8	8.5	19.09	30.0	-10.9	
3740.01	20.85	H	7.8	8.5	21.60	30.0	-8.4	
Mid Ch								
3840.00	18.63	V	8.0	8.5	19.11	30.0	-10.9	
3840.00	19.92	H	8.0	8.5	20.40	30.0	-9.6	
High Ch								
3939.99	17.29	V	8.2	8.7	17.77	30.0	-12.2	
3939.99	19.70	H	8.2	8.7	20.18	30.0	-9.8	

70MHz QPSK

70MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 70 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	18.35	V	7.8	8.5	19.12	30.0	-10.9	
3735.00	22.04	H	7.8	8.5	22.81	30.0	-7.2	
Mid Ch								
3840.00	17.45	V	8.0	8.5	17.93	30.0	-12.1	
3840.00	21.72	H	8.0	8.5	22.20	30.0	-7.8	
High Ch								
3945.00	12.90	V	8.2	8.7	13.39	30.0	-16.6	
3945.00	22.06	H	8.2	8.7	22.55	30.0	-7.5	

60MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 70 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	16.71	V	7.8	8.5	17.48	30.0	-12.5	
3735.00	20.14	H	7.8	8.5	20.91	30.0	-9.1	
Mid Ch								
3840.00	17.42	V	8.0	8.5	17.90	30.0	-12.1	
3840.00	20.11	H	8.0	8.5	20.59	30.0	-9.4	
High Ch								
3945.00	11.33	V	8.2	8.7	11.82	30.0	-18.2	
3945.00	19.84	H	8.2	8.7	20.33	30.0	-9.7	

60MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/23/2023
Test Engineer: 27700
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 60 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3730.02	16.58	V	7.7	8.5	17.37	30.0	-12.6	
3730.02	22.09	H	7.7	8.5	22.88	30.0	-7.1	
High Ch								
3949.98	17.97	V	8.2	8.7	18.46	30.0	-11.5	
3949.98	21.90	H	8.2	8.7	22.39	30.0	-7.6	

50MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 60 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3730.02	13.74	V	7.7	8.5	14.53	30.0	-15.5	
3730.02	19.69	H	7.7	8.5	20.48	30.0	-9.5	
High Ch								
3949.98	16.40	V	8.2	8.7	16.89	30.0	-13.1	
3949.98	20.02	H	8.2	8.7	20.51	30.0	-9.5	

50MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 27700
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 50 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3725.01	18.69	V	7.7	8.5	19.50	30.0	-10.5	
3725.01	21.50	H	7.7	8.5	22.31	30.0	-7.7	
Mid Ch								
3840.00	18.96	V	8.0	8.5	19.44	30.0	-10.6	
3840.00	22.19	H	8.0	8.5	22.67	30.0	-7.3	
High Ch								
3594.99	12.25	V	7.5	8.4	13.22	30.0	-16.8	
3594.99	22.01	H	7.5	8.4	22.98	30.0	-7.0	

40MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/24/2023
Test Engineer: 27700
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 50 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3725.01	16.99	V	7.7	8.5	17.80	30.0	-12.2	
3725.01	19.45	H	7.7	8.5	20.26	30.0	-9.7	
Mid Ch								
3840.00	17.04	V	8.0	8.5	17.52	30.0	-12.5	
3840.00	19.79	H	8.0	8.5	20.27	30.0	-9.7	
High Ch								
3594.99	16.40	V	7.5	8.4	17.37	30.0	-12.6	
3594.99	19.15	H	7.5	8.4	20.12	30.0	-9.9	

40MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 27700 JR
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 40 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	7.7	8.6	17.82	30.0	-12.2	
3720.00	22.30	H	7.7	8.6	23.13	30.0	-6.9	
Mid Ch								
3840.00	17.47	V	8.0	8.5	17.95	30.0	-12.1	
3840.00	23.24	H	8.0	8.5	23.72	30.0	-6.3	
High Ch								
3960.00	17.13	V	8.2	8.7	17.61	30.0	-12.4	
3960.00	22.95	H	8.2	8.7	23.43	30.0	-6.6	

30MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/25/2023
Test Engineer: 27700 JR
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 40 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	16.18	V	7.7	8.6	17.01	30.0	-13.0	
3720.00	20.87	H	7.7	8.6	21.70	30.0	-8.3	
Mid Ch								
3840.00	17.35	V	8.0	8.5	17.83	30.0	-12.2	
3840.00	20.63	H	8.0	8.5	21.11	30.0	-8.9	
High Ch								
3960.00	15.43	V	8.2	8.7	15.91	30.0	-14.1	
3960.00	20.76	H	8.2	8.7	21.24	30.0	-8.8	

30MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 30 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3715.02	17.80	V	7.7	8.6	18.64	30.0	-11.4	
3715.02	21.81	H	7.7	8.6	22.65	30.0	-7.3	
Mid Ch								
3840.00	17.52	V	8.0	8.5	18.00	30.0	-12.0	
3840.00	22.54	H	8.0	8.5	23.02	30.0	-7.0	
High Ch								
3964.98	16.04	V	8.2	8.7	16.52	30.0	-13.5	
3964.98	22.75	H	8.2	8.7	23.23	30.0	-6.8	

25MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 30 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3715.02	17.22	V	7.7	8.6	18.06	30.0	-11.9	
3715.02	20.22	H	7.7	8.6	21.06	30.0	-8.9	
Mid Ch								
3840.00	16.69	V	8.0	8.5	17.17	30.0	-12.8	
3840.00	20.73	H	8.0	8.5	21.21	30.0	-8.8	
High Ch								
3964.98	14.62	V	8.2	8.7	15.10	30.0	-14.9	
3964.98	21.42	H	8.2	8.7	21.90	30.0	-8.1	

25MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 25 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3712.50	20.10	V	7.7	8.6	20.94	30.0	-9.1	
3712.50	21.91	H	7.7	8.6	22.75	30.0	-7.2	
Mid Ch								
3840.00	16.60	V	8.0	8.5	17.08	30.0	-12.9	
3840.00	22.52	H	8.0	8.5	23.00	30.0	-7.0	
High Ch								
3967.50	15.94	V	8.2	8.7	16.42	30.0	-13.6	
3967.50	22.66	H	8.2	8.7	23.14	30.0	-6.9	

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 25 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3712.50	18.75	V	7.7	8.6	19.59	30.0	-10.4	
3712.50	21.07	H	7.7	8.6	21.91	30.0	-8.1	
Mid Ch								
3840.00	15.50	V	8.0	8.5	15.98	30.0	-14.0	
3840.00	20.26	H	8.0	8.5	20.74	30.0	-9.3	
High Ch								
3967.50	14.71	V	8.2	8.7	15.19	30.0	-14.8	
3967.50	20.86	H	8.2	8.7	21.34	30.0	-8.7	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 20 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3710.01	19.91	V	7.7	8.5	20.74	30.0	-9.3	
3710.01	21.85	H	7.7	8.5	22.68	30.0	-7.3	
Mid Ch								
3840.00	17.35	V	8.0	8.5	17.83	30.0	-12.2	
3840.00	22.06	H	8.0	8.5	22.54	30.0	-7.5	
High Ch								
3969.99	14.92	V	8.2	8.7	15.39	30.0	-14.6	
3969.99	21.81	H	8.2	8.7	22.28	30.0	-7.7	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/20232
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 20 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3710.01	19.02	V	7.7	8.5	19.85	30.0	-10.1	
3710.01	19.98	H	7.7	8.5	20.81	30.0	-9.2	
Mid Ch								
3840.00	16.08	V	8.0	8.5	16.56	30.0	-13.4	
3840.00	20.20	H	8.0	8.5	20.68	30.0	-9.3	
High Ch								
3969.99	14.04	V	8.2	8.7	14.51	30.0	-15.5	
3969.99	19.86	H	8.2	8.7	20.33	30.0	-9.7	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 15 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3707.52	20.72	V	7.7	8.5	21.54	30.0	-8.5	
3707.52	21.82	H	7.7	8.5	22.64	30.0	-7.4	
Mid Ch								
3840.00	16.35	V	8.0	8.5	16.83	30.0	-13.2	
3840.00	22.42	H	8.0	8.5	22.90	30.0	-7.1	
High Ch								
3972.48	15.04	V	8.2	8.7	15.51	30.0	-14.5	
3972.48	22.00	H	8.2	8.7	22.47	30.0	-7.5	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 15 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
3707.52	19.77	V	7.7	8.5	20.59	30.0	-9.4	
3707.52	20.86	H	7.7	8.5	21.68	30.0	-8.3	
Mid Ch								
3840.00	14.64	V	8.0	8.5	15.12	30.0	-14.9	
3840.00	20.77	H	8.0	8.5	21.25	30.0	-8.8	
High Ch								
3972.48	14.66	V	8.2	8.7	15.13	30.0	-14.9	
3972.48	21.19	H	8.2	8.7	21.66	30.0	-8.3	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_QPSK 10 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	17.83	V	7.7	8.5	18.65	30.0	-11.4	
3705.00	22.03	H	7.7	8.5	22.85	30.0	-7.2	
Mid Ch								
3840.00	17.31	V	8.0	8.5	17.79	30.0	-12.2	
3840.00	21.60	H	8.0	8.5	22.08	30.0	-7.9	
High Ch								
3975.00	13.96	V	8.3	8.7	14.43	30.0	-15.6	
3975.00	22.43	H	8.3	8.7	22.90	30.0	-7.1	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 14938215 (SM-A256E_DSN)
Date: 10/20/2023
Test Engineer: 19019
Configuration: EUT Only
Location: 03-RDE-C
Mode: FR1_N77c_16QAM 10 MHz Fundamentals

Test Equpment:
Receiving: Horn 226672, and 03-RDE-C SMA Cables
Substitution: Horn 223084, 03-RDE-C Passthrough Cables

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	16.43	V	7.7	8.5	17.25	30.0	-12.8	
3705.00	20.18	H	7.7	8.5	21.00	30.0	-9.0	
Mid Ch								
3840.00	15.94	V	8.0	8.5	16.42	30.0	-13.6	
3840.00	20.20	H	8.0	8.5	20.68	30.0	-9.3	
High Ch								
3975.00	13.19	V	8.3	8.7	13.66	30.0	-16.3	
3975.00	19.92	H	8.3	8.7	20.39	30.0	-9.6	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, and §27.53

LIMIT

FCC: §22.917(a) and §27.53 (g), (h)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

FCC: §27.53 (m) (NR n41)
At least 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.

FCC: §27.53 (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.

FCC: §27.53 (n)(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r02
All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.2.1. 5G NR n5

LIMITS

FCC: §22.917(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.