FCC TEST REPORT

Name of Sample:	**Mobile Cellular Phone**
Model of Sample:	**XT2453-7, XT2453-9**
Applicant:	**Motorola Mobility LLC**
Issue Date:	**2024-04-26**

ADR TEST AND CERTIFICATION CENTER

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Name of Client	Motorola Mobility LLC		
Address of Client	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA		
Trademark	Motorola	**Type Name or ID**	FCC ID: IHDT56AQ8
Applicant No.	RF176259	**Sample No.**	1#: NZ4J2A0013 2#: NZ4J2A0008
Delivering Date	2024-03-25	**Test Date**	2024-03-27 to 2024-04-25
Sample Illustration	None		
Standard	47 CFR Part 2; 47 CFR Part 22; 47 CFR Part 24; 47 CFR Part 27;		
Conclusion	Pass		
Remarks	N/A		

Editor: Wangzhenyu **Auditor:** Hexiaolin **Approver:** HuangshengLin

Matters Needing Attention

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Revision History

Report No.	Version	Description	Issued Date
TR-24ADRTCC7007	Rev.01	Initial issue of report	2024-04-12
TR-24ADRTCC7007	Rev.02	Update supported bandwidth list. Add n41 UL MIMO data. Update n41/n78 power	2024-04-25
TR-24ADRTCC7007	Rev.03	Update n41 max power in this file	2024-04-26
TR-24ADRTCC7007	Rev.04	Remove n41/n77/n78 spot check data. Updated n41/n77/n78 EIRP in this file.	2024-04-26

Catalogue

1. Test Summary

1.1. 5G NR Band n5

Test Item	Rule No.	Requirements	Test Result	Verdict
Conducted Power	§2.1046	Report Only	Section 1 of Appendix B	Pass
Effective Radiated Power	§22.913(a)(5)	ERP < 7W		
Peak-Average Ratio	§22.913(d)	<13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Occupied Bandwidth	§2.1049	No limit	Section 4 of Appendix B	Pass
26dB Emission Bandwidth		No limit		
Conducted Band Edges	§2.1051 §22.917(a)	< -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass
Conducted Spurious Emission	§2.1051 §22.917(a)	< -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges	Section 6 of Appendix B	Pass
Frequency Stability	§2.1055 §22.355	< ±2.5ppm	Section 7 of Appendix B	Pass

1.2. 5G NR Band n66

Test Item	Rule No.	Requirements	Test Result	Verdict
Conducted Power	§2.1046	Report Only	Section 1 of Appendix B	Pass
Effective Isotropic Radiated Power	§27.50(d)	EIRP < 1W		

1.3. 5G NR Band n41

Test Item	Rule No.	Requirements	Test Result	Verdict
Conducted Power	§2.1046	Report Only	Section 1 of Appendix B	Pass
Effective Isotropic Radiated Power	§27.50(h) (2)	EIRP < 2W		
Peak-Average Ratio	§27.50(a)	<13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Occupied Bandwidth	§2.1049	No limit	Section 4 of Appendix B	Pass
26dB Emission Bandwidth		No limit		
Conducted Band Edges	§2.1051 §27.53(m) (4)	For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section	Section 5 of Appendix B	Pass
Conducted Spurious Emission	§2.1051 §27.53(m) (4)	< -25 dBm/MHz for outside Band Edge Range	Section 6 of Appendix B	Pass
Frequency Stability	§27.54	Within authorized bands	Section 7 of Appendix B	Pass

1.4. 5G NR Band n77 (3700-3980)/n78 (3700-3800)

Test Item	Rule No.	Requirements	Test Result	Verdict
Conducted Power	§2.1046	Report Only	Section 1 of Appendix B	Pass
Effective Isotropic Radiated Power	§27.50(j) (3)	EIRP < 1W		
Peak-Average Ratio	§27.50(j) (4)	<13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Occupied Bandwidth	§2.1049	No limit	Section 4 of	Pass

Test Item	Rule No.	Requirements	Test Result	Verdict
26dB Emission Bandwidth		No limit	Appendix B	
Conducted Band Edges	§2.1051 §27.53(l) (2)	< -13 dBm/MHz	Section 5 of Appendix B	Pass
Conducted Spurious Emission	§2.1051 §27.53(l) (2)	< -13 dBm/MHz	Section 6 of Appendix B	Pass
Frequency Stability	§27.54	Within authorized bands	Section 7 of Appendix B	Pass

Remark:

1, Only 5G NR Bands conducted test performed and the data displayed in this report, the radiated spurious emission refer to the report (422203; 422203-02).

2, The maximum E(I)RP is calculated from max output power and max antenna gain, only the max E(I)RP data displayed in this report, n5 for Antenna 0; n41/n66 for antenna 2; n77/n78 for antenna 4.

2. Summary of 5G NR Spot Check

Test Item	Mode	Worst Mode Test Result		Deviation (dB)	Limit (dB)
		IHDT56AR7	IHDT56AQ8		
Conducted Power	n5	23.59	23.28	0.31	3
	n66	23.98	23.33	0.65	3

This application re-uses data collected on a similar device. The subject device of this application (Model: XT2453-7, XT2453-9, FCC ID: IHDT56AQ8) is electrically identical to the reference device (Model: XT2453-3, XT2453-4, XT2453-5, XT2453V, FCC ID: IHDT56AR7) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity. The FCC Part 22, 24, 27(equipment class: PCE) referencing the original model's result and do spot check, following the FCC KDB484596 D01 Referencing Test Data v02r02.

Compared the device (Model: XT2453-7, XT2453-9, FCC ID: IHDT56AQ8) with the reference device (Model: XT2453-3, XT2453-4, XT2453-5, XT2453V, FCC ID: IHDT56AR7). IHDT56AR7), according to the maximum conducted output power comparison result, therefor, band n5 was defined as the worst band and full test the conducted item to demonstrate the compliance, and the data displayed in appendix B.1.

Model difference information

The main difference between FCC ID: IHDT56AR7 and FCC ID: IHDT56AQ8 is as below:

- Remove LTE B13/14/25/29/30/48/71 and 5G NR n2/n7/n12/n14/n20/n25/n26/n29/n30/n38/ n40/n48/n70/n71.
- Add LTE B11/42.

Other difference and all the details of similarity and difference can be found in the confidential documents (XT2453-7, XT2453-9_Operational Description of Product Equality Declaration).

3. Maximum Effective Radiated (Isotropic) Power and Emission Designator

3.1. NR System

3.1.1. NR Band n41 (2496-2690)

5G NR NSA (DC_66A_n41A)		Pi/2 BPSK / QPSK		16QAM/64QAM/256QAM	
Bandwidth	Frequency Range (MHz)	Maximum EIRP (W)	Emission Designator (99% OBW)	Maximum EIRP (W)	Emission Designator (99% OBW)
5MHz	2498.51-2687.50	0.109396	4M48G7D	0.089536	4M47W7D
10MHz	2501.01-2685.00	0.114025	9M25G7D	0.092470	9M27W7D
15MHz	2503.50-2682.48	0.114551	14M1G7D	0.089536	14M1W7D
20MHz	2506.02-2679.99	0.113501	18M9G7D	0.091622	18M9W7D
25MHz	2508.51-2677.50	0.113763	23M7G7D	0.091411	23M8W7D
30MHz	2511.00-2674.98	0.114551	28M6G7D	0.093111	28M5W7D
35MHz	2513.50-2672.48	0.114288	33M5G7D	0.092257	33M5W7D
40MHz	2516.01-2670.00	0.114288	38M5G7D	0.091833	38M5W7D
45MHz	2518.51-2667.50	0.114288	43M2G7D	0.091201	43M2W7D
50MHz	2521.02-2664.99	0.114815	48M2G7D	0.092683	48M2W7D
60MHz	2526.00-2659.98	0.114551	57M8G7D	0.092470	57M8W7D
70MHz	2531.01-2655.00	0.115080	67M3G7D	0.091411	67M4W7D
80MHz	2536.02-2649.99	0.113763	77M4G7D	0.092897	77M5W7D
90MHz	2541.00-2644.98	0.114551	87M2G7D	0.093111	87M6W7D
100MHz	2546.01-2640.00	0.114551	97M3G7D	0.090157	97M5W7D

5G NR SA (n41A UL MIMO)		QPSK		16QAM/64QAM/256QAM	
Bandwidth	Frequency Range (MHz)	Maximum EIRP (W)	Emission Designator (99% OBW)	Maximum EIRP (W)	Emission Designator (99% OBW)
5MHz	2498.51-2687.50	0.076384	4M47G7D	0.067143	4M48W7D
10MHz	2501.01-2685.00	0.078705	9M27G7D	0.069984	9M29W7D
15MHz	2503.50-2682.48	0.078163	14M1G7D	0.071121	14M2W7D
20MHz	2506.02-2679.99	0.078886	18M9G7D	0.069984	18M9W7D
25MHz	2508.51-2677.50	0.077090	23M7G7D	0.068234	23M8W7D
30MHz	2511.00-2674.98	0.077983	28M5G7D	0.070146	28M5W7D
35MHz	2513.50-2672.48	0.078163	33M5G7D	0.069984	33M6W7D
40MHz	2516.01-2670.00	0.078524	38M5G7D	0.069663	38M7W7D
45MHz	2518.51-2667.50	0.077090	43M2G7D	0.069343	43M3W7D
50MHz	2521.02-2664.99	0.077983	48M1G7D	0.069343	48M2W7D
60MHz	2526.00-2659.98	0.077268	57M7G7D	0.068391	57M8W7D
70MHz	2531.01-2655.00	0.099770	67M3G7D	0.092683	67M4W7D
80MHz	2536.02-2649.99	0.098628	77M4G7D	0.090157	77M4W7D
90MHz	2541.00-2644.98	0.098175	87M2G7D	0.088716	87M2W7D
100MHz	2546.01-2640.00	0.098175	97M3G7D	0.089536	97M3W7D

3.1.2. NR Band n5 (824-849)

5G NR SA (n5A)		Pi/2 BPSK / QPSK		16QAM/64QAM/256QAM	
Bandwidth	Frequency Range (MHz)	Maximum ERP (W)	Emission Designator (99% OBW)	Maximum ERP (W)	Emission Designator (99% OBW)
5MHz	826.5-846.5	0.051642	4M50G7D	0.045920	4M50W7D
10MHz	829.0-844.0	0.053827	9M29G7D	0.042170	9M27W7D
15MHz	831.5-841.5	0.052360	14M1G7D	0.045920	14M1W7D
20MHz	834.0-839.0	0.053088	18M9G7D	0.043652	18M9W7D

3.1.3. NR Band n77 (3700-3980)

5G NR NSA (DC_41A_n77A)		Pi/2 BPSK / QPSK		16QAM/64QAM/256QAM	
Bandwidth	Frequency Range (MHz)	Maximum EIRP (W)	Emission Designator (99% OBW)	Maximum EIRP (W)	Emission Designator (99% OBW)
10MHz	3705.00-3975.00	0.154525	9M27G7D	0.122744	9M29W7D
15MHz	3707.52-3972.48	0.156675	14M1G7D	0.122462	14M1W7D
20MHz	3710.01-3969.99	0.156675	18M9G7D	0.121899	18M9W7D
25MHz	3712.50-3967.50	0.158489	23M7G7D	0.124165	23M8W7D
30MHz	3715.02-3964.98	0.157036	28M6G7D	0.125893	28M5W7D
40MHz	3720.00-3960.00	0.158489	38M5G7D	0.124165	38M5W7D
50MHz	3725.01-3954.99	0.157398	48M2G7D	0.123880	48M2W7D
60MHz	3730.02-3949.98	0.155955	57M9G7D	0.124165	57M8W7D
70MHz	3735.00-3945.00	0.158125	67M4G7D	0.125026	67M4W7D
80MHz	3740.01-3939.99	0.158855	77M4G7D	0.126474	77M4W7D
90MHz	3745.02-3934.98	0.159956	87M4G7D	0.125314	87M4W7D
100MHz	3750.00-3930.00	0.158489	97M3G7D	0.123880	97M5W7D

3.1.4. NR Band n78 (3700-3800)

5G NR NSA (DC_41A_n78A)		Pi/2 BPSK / QPSK		16QAM/64QAM/256QAM	
Bandwidth	Frequency Range (MHz)	Maximum EIRP (W)	Emission Designator (99% OBW)	Maximum EIRP (W)	Emission Designator (99% OBW)
10MHz	3705.00-3795.00	0.158489	9M27G7D	0.125026	9M29W7D
15MHz	3707.52-3792.48	0.157398	14M1G7D	0.123310	14M1W7D
20MHz	3710.01-3789.99	0.158489	18M9G7D	0.123310	18M9W7D
25MHz	3712.50-3787.50	0.157398	23M7G7D	0.123310	23M8W7D
30MHz	3715.02-3784.98	0.157761	28M6G7D	0.120781	28M5W7D
40MHz	3720.00-3780.00	0.156315	38M6G7D	0.121899	38M5W7D
50MHz	3725.01-3774.99	0.157761	48M2G7D	0.121339	48M3W7D
60MHz	3730.02-3769.98	0.156675	57M8G7D	0.121899	57M8W7D
70MHz	3735.00-3765.00	0.158489	67M4G7D	0.127057	67M4W7D
80MHz	3740.01-3759.99	0.156675	77M5G7D	0.127938	77M7W7D
90MHz	3745.02-3754.98	0.158125	87M6G7D	0.127644	87M6W7D
100MHz	3750.00	0.155955	97M3G7D	0.128825	97M5W7D

4. General Information

4.1. General Description of EUT

EUT Description:	Mobile Cellular Phone
Brand Name:	Motorola
Model Name:	XT2453-7, XT2453-9
FCC ID:	IHDT56AQ8
IMEI Code:	1#: 356537710004855/356537710004863 (Conducted); 2#: 356537710004897/356537710004905 (Conducted);
Hardware Version:	DVT2
Software Version:	U3UC34.39
NR Modulation:	DFT-s-OFDM: ☒Pi/2BPSK; ☒ QPSK; ☒ 16QAM; ☒ 64QAM; ☒ 256QAM; CP-OFDM: ☒ QPSK; ☒ 16QAM; ☒ 64QAM; ☒ 256QAM;
Sample Type:	☒ Portable Device, ☐Module
Antenna Type:	☐External, ☒ Integrated
Antenna Gain:	n5: -3.82dBi (Ant0); -4.93dBi (Ant1); n41: 0.01dBi (Ant0); -0.66dBi (Ant1); -3.13dBi (Ant2); -3.30dBi (Ant3); n66: -2.18dBi (Ant0); -1.88dBi (Ant1); -2.18dBi (Ant2); -3.41dBi (Ant3); n77: -5.82dBi (Ant3); -1.89dBi (Ant4); -2.96dBi (Ant6); -3.00dBi (Ant8); n78: -5.82dBi (Ant3); -1.89dBi (Ant4); -2.96dBi (Ant6); -3.00dBi (Ant8);

Remark

1, The information above was declared by manufacture. Please refer to the specifications or user manual for more detailed description.

4.2. Test Environment

Relative Humidity:	52.0% - 62.0%	
Atmospheric Pressure:	101.32 KPa	
Temperature:	NT (normal temperature)	25.0 °C – 27.5 °C
Voltage:	LV (Low voltage)	3.40V
	NV (Nominal voltage)	3.88V
	HV (High voltage)	4.48V

4.3. Specification of Accessories

Accessory	Brand Name	Model Name
Battery 1	Motorola	QR11
Battery 2	Motorola	QR31

5. Test Configuration of Equipment Under Test

5.1. Test Mode for NR Configuration

Test Case	5G NR	SCS		Bandwidth	Modulation					Channel			RB	
		15KHz	30KHz		Pi/2BPSK	QPSK	16QAM	64QAM	256QAM	LCH	MCH	HCH	1	Full
Effective Isotropic Radiated Power	N5 (824-849)	●	●	All Supported BW	●	●	●	●	●	●	●	●	●	●
	N41 (2496-2690)	●	●	All Supported BW	●	●	●	●	●	●	●	●	●	●
	N66 (1710-1780)	●	●	All Supported BW	●	●	●	●	●	●	●	●	●	●
	N77 (3700-3980)	●	●	All Supported BW	●	●	●	●	●	●	●	●	●	●
	N78(3700-3800)	●	●	All Supported BW	●	●	●	●	●	●	●	●	●	●
Peak-Average Ratio	N41 (2496-2690)	●	●	Highest BW	●	●	○	○	○	●	●	●	○	●
	N5 (824-849)	●	●	Highest BW	●	●	○	○	○	●	●	●	○	●
	N77 (3700-3980)	●	●	Highest BW	●	●	○	○	○	●	●	●	○	●
	N78(3700-3800)	●	●	Highest BW	●	●	○	○	○	●	●	●	○	●
Modulation Characteristics	N41 (2496-2690)	●	●	Highest BW	●	●	●	●	●	○	●	○	○	●
	N5 (824-849)	●	●	Highest BW	●	●	●	●	●	○	●	○	○	●
	N77 (3700-3980)	●	●	Highest BW	●	●	●	●	●	○	●	○	○	●
	N78(3700-3800)	●	●	Highest BW	●	●	●	●	●	○	●	○	○	●
Occupied Bandwidth & 26dB Emission Bandwidth	N41 (2496-2690)	●	●	All Supported BW	●	●	●	●	●	○	●	○	○	●
	N5 (824-849)	●	●	All Supported BW	●	●	●	●	●	○	●	○	○	●
	N77 (3700-3980)	●	●	All Supported BW	●	●	●	●	●	○	●	○	○	●
	N78(3700-3800)	●	●	All Supported BW	●	●	●	●	●	○	●	○	○	●
Conducted Band Edges	N41 (2496-2690)	●	●	All Supported BW	●	●	○	○	○	●	○	●	●	●
	N5 (824-849)	●	●	All Supported BW	●	●	○	○	○	●	○	●	●	●
	N77 (3700-3980)	●	●	All Supported BW	●	●	○	○	○	●	○	●	●	●
	N78(3700-3800)	●	●	All Supported BW	●	●	○	○	○	●	○	●	●	●
Conducted Spurious Emission	N41 (2496-2690)	●	●	All Supported BW	●	●	○	○	○	●	●	●	●	○
	N5 (824-849)	●	●	All Supported BW	●	●	○	○	○	●	●	●	●	○
	N77 (3700-3980)	●	●	All Supported BW	●	●	○	○	○	●	●	●	●	○
	N78(3700-3800)	●	●	All Supported BW	●	●	○	○	○	●	●	●	●	○
Frequency Stability	N41 (2496-2690)	●	●	Highest BW	○	●	○	○	○	○	●	○	○	●
	N5 (824-849)	●	●	Highest BW	○	●	○	○	○	○	●	○	○	●
	N77 (3700-3980)	●	●	Highest BW	○	●	○	○	○	○	●	○	○	●
	N78(3700-3800)	●	●	Highest BW	○	●	○	○	○	○	●	○	○	●

Remark:

1, the mark "●" means this configuration was chosen for testing, mark "○" means not selected, and the mark "✘" means not applicable.

2, All Supported BW means all supported bandwidth for selected SCS configuration.

5.2. Test Frequencies

5.2.1. 5G NR System

5.2.1.1. NR Band n5 (824-849)

5.2.1.1.1. SCS=15KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
5MHz	165300	826.5	167300	836.5	169300	846.5
10MHz	165800	829.0	167300	836.5	168800	844.0
15MHZ	166300	831.5	167300	836.5	168300	841.5
20MHz	166800	834.0	167300	836.5	167800	839.0

5.2.1.1.2. SCS=30KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	165800	829.0	167300	836.5	168800	844.0
15MHZ	166300	831.5	167300	836.5	168300	841.5
20MHz	166800	834.0	167300	836.5	167800	839.0

5.2.1.2. NR Band n41 (2496-2690)

5.2.1.2.1. SCS=15KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
5MHz	499701	2498.505	518601	2593.005	537500	2687.50
10MHz	500202	2501.01	518601	2593.005	537000	2685.00
15MHz	500700	2503.50	518601	2593.005	536496	2682.48
20MHz	501204	2506.02	518601	2593.005	535998	2679.99
25MHz	501702	2508.51	518601	2593.005	535500	2677.50
30MHz	502200	2511.00	518601	2593.005	534996	2674.98
35MHz	502701	2513.505	518601	2593.005	534500	2672.50
40MHz	503202	2516.01	518601	2593.005	534000	2670.00
45MHz	503700	2518.50	518601	2593.005	533500	2667.50
50MHz	504202	2521.005	518601	2593.005	532998	2664.99

5.2.1.2.2. SCS=30KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	500202	2501.01	518598	2592.99	537000	2685.00
15MHz	500700	2503.50	518598	2592.99	536496	2682.48
20MHz	501204	2506.02	518598	2592.99	535998	2679.99
25MHz	501702	2508.01	518598	2592.99	535500	2677.50
30MHz	502200	2511.00	518598	2592.99	534996	2674.98
35MHz	502701	2513.505	518598	2592.99	534500	2672.50
40MHz	503202	2516.01	518598	2592.99	534000	2670.00
45MHz	503700	2518.50	518598	2592.99	533500	2667.50
50MHz	504204	2521.02	518598	2592.99	532998	2664.99

60MHz	505200	2526.00	518598	2592.99	531996	2659.98
70MHz	506202	2531.01	518598	2592.99	531000	2655.00
80MHz	507204	2536.02	518598	2592.99	529998	2649.99
90MHz	508200	2541.00	518598	2592.99	528996	2644.98
100MHz	509202	2546.01	518598	2592.99	528000	2640.00

5.2.1.3. NR Band n66 (1710-1780)

5.2.1.3.1. SCS=15KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
5MHz	342500	1712.5	349000	1745.0	355500	1777.5
10MHz	343000	1715.0	349000	1745.0	355000	1775.0
15MHz	343500	1717.5	349000	1745.0	354500	1772.5
20MHz	344000	1720.0	349000	1745.0	354000	1770.0
25MHz	344500	1722.5	349000	1745.0	353500	1767.5
30MHz	345000	1725.0	349000	1745.0	353000	1765.0
35MHz	345500	1727.5	349000	1745.0	352500	1762.5
40MHz	346000	1730.0	349000	1745.0	352000	1760.0

5.2.1.3.2. SCS=30KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	343000	1715.0	349000	1745.0	355000	1775.0
15MHz	343500	1717.5	349000	1745.0	354500	1772.5
20MHz	344000	1720.0	349000	1745.0	354000	1770.0
25MHz	344500	1722.5	349000	1745.0	353500	1767.5
30MHz	345000	1725.0	349000	1745.0	353000	1765.0
35MHz	345500	1727.5	349000	1745.0	352500	1762.5
40MHz	346000	1730.0	349000	1745.0	352000	1760.0

5.2.1.4. NR Band N77 (3700-3980)

5.2.1.4.1. SCS=15KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	647000	3705.00	656000	3840.00	665000	3975.00
15MHz	647168	3707.52	656000	3840.00	664832	3972.48
20MHz	647334	3710.01	656000	3840.00	664666	3969.99
25MHz	647500	3712.50	656000	3840.00	664500	3967.50
30MHz	647668	3715.02	656000	3840.00	664332	3964.98
40MHz	648000	3720.00	656000	3840.00	664000	3960.00
50MHz	648334	3725.01	656000	3840.00	663666	3954.99

5.2.1.4.2. SCS=30KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	647000	3705.00	656000	3840.00	665000	3975.00
15MHz	647168	3707.52	656000	3840.00	664832	3972.48
20MHz	647334	3710.01	656000	3840.00	664666	3969.99
25MHz	647500	3712.50	656000	3840.00	664500	3967.50
30MHz	647668	3715.02	656000	3840.00	664332	3964.98
40MHz	648000	3720.00	656000	3840.00	664000	3960.00
50MHz	648334	3725.01	656000	3840.00	663666	3954.99
60MHz	648668	3730.02	656000	3840.00	663332	3949.98
70MHz	649000	3735.00	656000	3840.00	663000	3945.00
80MHz	649334	3740.01	656000	3840.00	662666	3939.99
90MHz	649668	3745.02	656000	3840.00	662332	3934.98
100MHz	650000	3750.00	656000	3840.00	662000	3930.00

5.2.1.5. NR Band N78 (3700-3800)

5.2.1.5.1. SCS=15KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	647000	3705.00	650000	3750.00	653000	3795.00
15MHz	647168	3707.52	650000	3750.00	652832	3792.48
20MHz	647334	3710.01	650000	3750.00	652666	3789.99
25MHz	647500	3712.50	650000	3750.00	652500	3787.50
30MHz	647668	3715.02	650000	3750.00	652332	3784.98
40MHz	648000	3720.00	650000	3750.00	652000	3780.00
50MHz	648334	3725.01	650000	3750.00	651666	3774.99

5.2.1.5.2. SCS=30KHz

Bandwidth	LCH		MCH		HCH	
	Arfcn	Freq	Arfcn	Freq	Arfcn	Freq
10MHz	647000	3705.00	650000	3750.00	653000	3795.00
15MHz	647168	3707.52	650000	3750.00	652832	3792.48
20MHz	647334	3710.01	650000	3750.00	652666	3789.99
25MHz	647500	3712.50	650000	3750.00	652500	3787.50
30MHz	647668	3715.02	650000	3750.00	652332	3784.98
40MHz	648000	3720.00	650000	3750.00	652000	3780.00
50MHz	648334	3725.01	650000	3750.00	651666	3774.99
60MHz	648668	3730.02	650000	3750.00	651332	3769.98
70MHz	649000	3735.00	650000	3750.00	651000	3765.00
80MHz	649334	3740.01	650000	3750.00	650666	3759.99
90MHz	649668	3745.02	650000	3750.00	650332	3754.98
100MHz	650000	3750.00	650000	3750.00	650000	3750.00

6. Description of Tests

6.1. Conducted Output Power Measurement

6.1.1. Description of Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT, Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

6.1.2. Test Procedures

1，The testing follows ANSI C63.26 Section 5.2.
2，The transmitter output port was connected to the system simulator.
3，Set EUT at maximum power through the system simulator.
4，Select lowest, Middle, Highest channels for each band and each modulation.
5，Record the reading power from the system simulator.

6.2. Effective (Isotropic) Radiated Power

Measurement Procedure: ANSI C63.26

Calculate power in dBm by the following formula:

ERP (dBm) = Conducted Power (dBm) + antenna gain (dBd)

EIRP (dBm) = Conducted Power (dBm) + antenna gain (dBi)

EIRP=ERP+2.15dB

6.3. Peak-to-Average Ratio Measurement

6.3.1. Description of PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis, A CCDF curve depicts the probability of peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

6.3.2. Test Procedures

1，The testing follows ANSI C63.26 Section 5.2.3.4(CCDF)
2，Refer to instrument's analyser instruction manual for details on how to use the power statistics/CCDF function.
3，Centre Frequency = Carrier centre frequency.
4，Set resolution bandwidth ≥ signal's occupied bandwidth.
5，Set the number of counts to a value that stabilizes the measured CCDF curve.
6，Set the measurement interval as follows:
1) for continuous transmissions (>98% duty cycle), set to 1ms.
2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
7，Record the maximum PAR level associated with a probability of 0.1%.

6.3.3. Alternate procedure for PAR

Measurement Procedure: 5.2.6 of ANSI C63.26

Some regulatory requirements specify a PAR limit when the output power limits are specified in terms of average power. If it becomes necessary to provide measurement data to demonstrate compliance to a PAR

limit, then the appropriate procedure from those provided in 5.2.3 shall be utilized to determine the peak power (or peak PSD) and the appropriate procedure from those provided in 5.2.4 shall be used to determine the average power (or average PSD). The data from these measurements is then used in Equation (2) to determine the PAR of a narrowband CW-like signal. See 5.2.3.4 for guidance on determining the PAR of a broadband noise-like signal.

PAR (dB) = P_{Pk} (dBm or dBW) − P_{Avg} (dBm or dBW)

where

PAR peak-to-average power ratio, in dB

P_{Pk} measured peak power or peak PSD level, in dBm or dBW

P_{Avg} measured average power or average PSD level, in dBm or dBW

6.4. 99% Occupied Bandwidth & 26dB Emission Bandwidth

6.4.1. Description of 99% Occupied Bandwidth & 26dB Emission Bandwidth Measurement

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel, middle channel and high channel). The span of the analyser shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

6.4.2. Test Procedures

1, The testing follows ANSI C63.26 Section 5.4

2, The signal analyzer's automatic measurement capability was used to perform the 99% occupied bandwidth and the 26dB emission bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

3, RBW ⩾1% - 5% of the expected OBW.

4, VBW ⩾3 * RBW

5, Detector=Peak

6, Trace Mode= Max Hold.

7, Sweep Time=Auto

8, The trace was allowed to stabilize.

9, If necessary, steps 2-7 were repeated after changing the RBW such that it would be within 1%-5% of the 99% occupied bandwidth observed in step 7.

6.5. Conducted Band Edge Measurement

6.5.1. Description of Conducted Band Edge Measurement

The transmitter output was connected to a calibrated coaxial cable, attenuator and spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at two frequencies (low channel and

high channel).in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emissions are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyser was set at thrice the resolution bandwidth. Detector Mode was set to peak or peak hold power.

6.5.2. Test Procedures

1， The testing follows ANSI C63.26 Section 5.7
2， Start and stop frequency were set such that the band edge would be placed in the centre of the spectrum analyzer screen.
3， Span was set large enough to capture all out of band emissions near the band edge.
4， RBW ≥1% of the emission bandwidth (2% of the emission bandwidth for n7/n38/n41 except when 1MHz band is 2495-2496MHz);
5， VBW ≥3 * RBW
6， Detector=RMS
7， Trace Mode=Trace Average for continuous emissions, Max Hold for pulse emissions.
8， Sweep Points ≥2 x Span/RBW
9， Sweep Time = Auto
10， The trace was allowed to stabilize.

6.6. Conducted Spurious Emission Measurement

6.6.1. Description of Conducted Spurious Emission Measurement

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel). The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyser. The spectrum is scanned from 9KHz up to a frequency including its 10th harmonic or 40GHz, which is lower.

6.6.2. Test Procedures

1， The testing follows ANSI C63.26 Section 5.7
2， RBW ≥100KHz for emissions below 1GHz,1MHz for emissions above 1GHz.
3， VBW ≥3 * RBW
4， Detector = RMS
5， Trace Mode = Average.
6， Sweep Points ≥2 * Span/RBW
7， Sweep Time = Auto
8， The trace was allowed to stabilize.

6.7. Frequency Stability Measurement

6.7.1. Description of Frequency Stability Measurement

The Frequency Stability should be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emissions stays within the authorized frequency block.

6.7.2. Measurement Procedure for Temperature Variation

1， The testing follows ANSI C63.26 section 5.6.4.
2， The EUT was set up in the thermal chamber and connected with the system simulator.

3, With power off, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.

4, With power off, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum change in frequency was recorded within one minute.

6.7.3. Measurement Procedure for Voltage Variation

1, The testing follows ANSI C63.26 section 5.6.5.

2, The EUT was placed in a thermal chamber at 20±5°C and connected with the system simulator.

3, The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.

4, For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

5, The variation in frequency was measured for the worst case.

7. List of Measuring Equipment

Equipment	Model	Manufacture	Device No.	Cal Date	Cal Due
Radio Communication Analyzer	MT8000A	Anritsu	6272478367	2023-12-07	2024-12-06
	MT8821C	Anritsu	6272498303	2023-12-07	2024-12-06
Radio Communication Analyzer	E7515E	Keysight	MY59296045	2023-12-07	2024-12-06
Spectrum Analyzer (50Hz-40GHz)	FSV	R&S	101046	2023-12-07	2024-12-06
Spectrum Analyzer (50Hz-40GHz)	FSV	R&S	101334	2024-01-30	2025-01-29
Power Supply	2036	Keithley	4058748	2023-12-07	2024-12-06
Temperature Chamber	C/64/40/3	Weiss	56246017780020	2024-04-01	2025-03-31
Power Divider	-	WOKEN	0120A04051801O	NCR	
Power Divider	-	WOKEN	0120A02051801M	NCR	

Remark:

1, For equipment listed above that has a calibration date or calibration due date that falls within the test date range, and the equipment was used after calibrate date and before calibrate due date.

2, “NCR” means no calibration required.

8. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26. All the measurement uncertainties value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be directly to specified limit to determine compliance.

8.1. Uncertainty of Conducted Measurement

Contribution	Expanded Uncertainty
Conducted Power	± 0.77
Conducted Emission	± 0.76
Channel Bandwidth	± 0.08%

9. Appendixes

Appendix B.1	NR Band n5A (824-849)
Appendix B.2	NR Band DC_66A_n41A (2496-2690)
Appendix B.3	NR Band DC_41A_n77A (3700-3980)
Appendix B.4	NR Band DC_41A_n78A (3700-3800)
Appendix B.5	NR Band n41A (2496-2690)_2x2MIMO

The End