



FCC RF Test Report

APPLICANT : Nokia Shanghai Bell Co., Ltd.
EQUIPMENT : Nokia FastMile 5G Gateway 12
BRAND NAME : Nokia
MODEL NAME : 5G31-03W-B
FCC ID : 2ADZR5G3103WB
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(M), 27(N), 27(O),
27(Q), 96
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TEST DATE(S) : May 09, 2024

We, Sporton International Inc. (KunShan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (KunShan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (Kunshan)

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG4321010	Rev. 01	Initial issue of report	Jun. 21, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1053 §22.917(a) §24.238(a) §27.53(h) §27.53(g) §27.53(l)(2)	Radiated Spurious Emission (Band n2) (Band n5) (Band n25) (Band n66) (Band n71) (Band n77)	$< 43 + 10\log_{10}(P[\text{Watts}])$	PASS	Under limit 20.16 dB at 14425.00 MHz
	§2.1053 §27.53 (n)(2)	Radiated Spurious Emission (Band n77)	-13dBm/MHz		
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission ((Band n38, n41)	$< 55 + 10\log_{10}(P[\text{Watts}])$		
	§2.1051 §96.41	Radiated Spurious Emission (Band n48)	-40dBm/MHz		

Remark: The conducted test items of inter band CA were cover by 5G NR single carrier due to the CA power is reduced according to 3GPP MPR.

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Nokia Shanghai Bell Co., Ltd.

388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2 Manufacturer

Nokia Solutions and Networks Oy

Karakaari 7, 02610 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Nokia FastMile 5G Gateway 12
Brand Name	Nokia
Model Name	5G31-03W-B
FCC ID	2ADZR5G3103WB
IMEI Code	Radiation: 355630740001412
HW Version	3TG03021Exxx (x may be from A to Z)
SW Version	5GGW-QCOM7X_D240200B31T0601E0496
EUT Stage	Identical Prototype

Remark: There are three samples under test, only different for the antenna manufacturers as below. According to the difference, we choose sample 1 to full test and the sample 2/3 are verified the RSE worse cases of LTE/NR in another report.

Ant Description	P/N	Vendor_1	Vendor_2	Vendor_3
Ant0&WiFi3_2.4G	3TG03393AAAA	GW12-A0W3	N42NKASA-PK1-D1X95BUD150U4LI	NKH049-15-000-R
Ant1&WiFi2_6G	3TG03394AAAA	GW12-A1W2	N40NKASB-PK1-E1X190BUE110U4LI	NKH050-15-000-R
Ant 2,Ant3,Ant5,Ant7	3TG03395AAAA	GW12-A2357	N40NKASC-PK1-R150U4LID115U4LI E165U4LIA105U4LI	NKH051-15-000-R
Ant4,Ant6&Ant9	3TG03396AAAA	GW12-A469	N40NKASD-PK1-A135U4LID170U4LI E200U4LI	NKH052-15-000-R
WiFi1_6G	3TG03397AAAA	GW12-W1	N06NKASF-PK1-A1X95BU	NKH053-15-000-R
WiFi4_2.4G	3TG03398AAAA	GW12-W4	N01NKASG-PK1-R1X160BU	NKH054-15-000-R
WiFi5_5G	3TG03399AAAA	GW12-W5	N02NKASH-PK1-D1X90BU	NKH055-15-000-R
Ant8&WiFi6_5G	3TG03400AAAA	GW12-A8W6	N43NKASE-PK1-E1X95BUA165U4LI	NKH056-15-000-R
WiFi7_5G	3TG03401AAAA	GW12-W7	N02NKASJ-PK1-A1X95BU	NKH057-15-000-R
WiFi8_5G	3TG03402AAAA	GW12-W8	N02NKASK-PK1-R1X115BU	NKH058-15-000-R

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification				
Tx Frequency	5G NR n2 : 1850 MHz ~ 1910 MHz			
	5G NR n5 : 824 MHz ~ 849 MHz			
	5G NR n25 : 1850 MHz ~ 1915 MHz			
	5G NR n38 : 2570 MHz ~ 2620 MHz			
	5G NR n41 : 2496 MHz ~ 2690 MHz			
	5G NR n48: 3550 MHz ~ 3700 MHz			
	5G NR n66 : 1710 MHz ~ 1780 MHz			
	5G NR n71: 663 MHz ~ 698 MHz			
	5G NR n77 : 3450 MHz ~ 3550 MHz (Part 27O)			
	5G NR n77 : 3700 MHz ~ 3980 MHz (Part 27Q)			
Rx Frequency	5G NR n2 : 1930 MHz ~ 1990 MHz			
	5G NR n5 : 869 MHz ~ 894 MHz			
	5G NR n25 : 1930 MHz ~ 1995 MHz			
	5G NR n38 : 2570 MHz ~ 2620 MHz			
	5G NR n41 : 2496 MHz ~ 2690 MHz			
	5G NR n48: 3550 MHz ~ 3700 MHz			
	5G NR n66 : 2110 MHz~ 2200 MHz			
	5G NR n71: 617 MHz ~ 652 MHz			
SCS	15kHz for FDD bands, 30kHz for TDD bands			
Uplink CA Bands	n2A-n77A	n41A-n25A	n66A-n41A	n66A-n71A
	n77A-n2A	n77A-n25A	n71A-n41A	n66A-n77A
	n5A-n77A	n38A-n66A	n48A-n41A	n71A-n66A
	n77A-n5A	n66A-n38A	n48A-n66A	n77A-n66A
	n25A-n41A	n41A-n66A	n41A-n48A	n71A-n77A
	n25A-n77A	n41A-n71A	n66A-n48A	n77A-n71A
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM			
	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM			

Note: For all uplink inter-band CA combination, only the worst combinations is tested and recorded in the report.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	210616

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 22(H), 24(E), 27(L), 27(M), 27(N), 27(O), 27(Q), 96
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

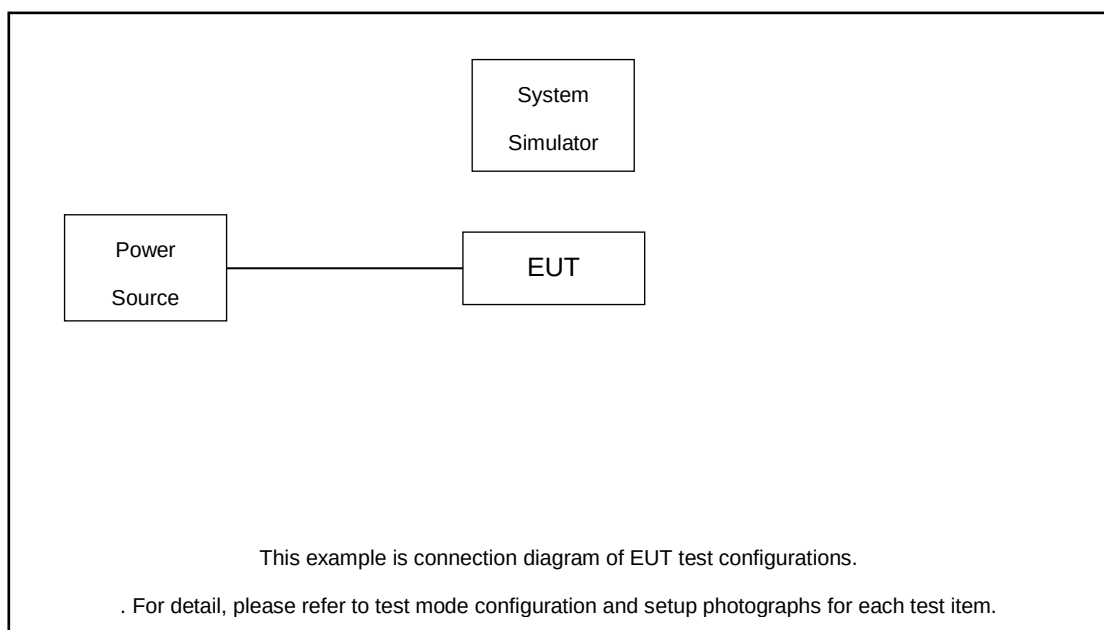
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission. (Y/Z-Plane)

Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Radiated Spurious Emission	n2A-n77A	Worst Case														v	
	n5A-n77A	Worst Case														v	
	n25A-n41A	Worst Case														v	
	n41A-n66A	Worst Case														v	
	n48A-n66A	Worst Case														v	
	n66A-n77A	Worst Case														v	
	n71A-n77A	Worst Case														v	
Note	1. The mark “v ” means that this configuration is chosen for testing 2. The mark “-” means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. For band n77, only the worst result of Part 27O is tested and recorded in the report. 5. n38A-n66A is covered by n41A-n66A, so not tested.																

2.2 Connection Diagram of Test System





2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Frequency List of Low/Middle/High Channels

5G NR n2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	374000	376000	378000
	Frequency	1870	1880	1890
30	Channel	373000	376000	379000
	Frequency	1865.0	1880	1895.0
25	Channel	372500	376000	379500
	Frequency	1862.5	1880	1897.5
20	Channel	372000	376000	380000
	Frequency	1860	1880	1900
15	Channel	371500	376000	380500
	Frequency	1857.5	1880	1902.5
10	Channel	371000	376000	381000
	Frequency	1855	1880	1905
5	Channel	370500	376000	381500
	Frequency	1852.5	1880	1907.5

5G NR n5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	166800	167300	167800
	Frequency	834	836.5	839
15	Channel	166300	167300	168300
	Frequency	831.5	836.5	841.5
10	Channel	165800	167300	168800
	Frequency	829	836.5	844
5	Channel	165300	167300	169300
	Frequency	826.5	836.5	846.5



5G NR n25 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	374000	376500	379000
	Frequency	1870	1882.5	1895
30	Channel	373000	376500	380000
	Frequency	1865	1882.5	1900
25	Channel	372500	376500	380500
	Frequency	1862.5	1882.5	1902.5
20	Channel	372000	376500	381000
	Frequency	1860	1882.5	1905
15	Channel	371500	376500	381500
	Frequency	1857.5	1882.5	1907.5
10	Channel	371000	376500	382000
	Frequency	1855	1882.5	1910
5	Channel	370500	376500	382500
	Frequency	1852.5	1882.5	1912.5

5G NR n38 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	518000	519000	520000
	Frequency	2590	2595	2600
30	Channel	517000	519000	521000
	Frequency	2585	2595	2605
20	Channel	516000	519000	522000
	Frequency	2580	2595	2610

5G NR n41 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	509202	518598	528000
	Frequency	2546.01	2592.99	2640
90	Channel	508200	518598	528996
	Frequency	2541	2592.99	2644.98
80	Channel	507204	518598	529998
	Frequency	2536.02	2592.99	2649.99
70	Channel	506202	518598	531000
	Frequency	2531.01	2592.99	2655
60	Channel	505200	518598	531996
	Frequency	2526	2592.99	2659.98



50	Channel	504204	518598	532998
	Frequency	2521.02	2592.99	2664.99
40	Channel	503202	518598	534000
	Frequency	2516.01	2592.99	2670
30	Channel	502200	518598	534996
	Frequency	2511	2592.99	2674.98
20	Channel	501204	518598	535998
	Frequency	2506.02	2592.99	2679.99

5G NR n48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	638000	641666	645332
	Frequency	3570	3624.99	3679.98
30	Channel	637666	641666	645666
	Frequency	3564.99	3624.99	3684.99
20	Channel	637334	641666	646000
	Frequency	3560.01	3624.99	3690

5G NR n66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	346000	349000	352000
	Frequency	1730	1745	1760
30	Channel	345000	349000	353000
	Frequency	1725	1745	1765
25	Channel	344500	349000	353500
	Frequency	1722.5	1745	1767.5
20	Channel	344000	349000	354000
	Frequency	1720	1745	1770
15	Channel	343500	349000	354500
	Frequency	1717.5	1745	1772.5
10	Channel	343000	349000	355000
	Frequency	1715	1745	1775
5	Channel	342500	349000	355500
	Frequency	1712.5	1745	1777.5



5G NR n71 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	134600	136100	137600
	Frequency	673	680.5	688
15	Channel	134100	136100	138100
	Frequency	670.5	680.5	690.5
10	Channel	133600	136100	138600
	Frequency	668	680.5	693
5	Channel	133100	136100	139100
	Frequency	665.5	680.5	695.5

5G n77 Channel and Frequency List for Part 270				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	650000	656000	662000
	Frequency	3750	3840	3930
90	Channel	649668	656000	662332
	Frequency	3745.02	3840	3934.98
80	Channel	649334	656000	662666
	Frequency	3740.01	3840	3939.99
70	Channel	649000	656000	663000
	Frequency	3735	3840	3945
60	Channel	648668	656000	663332
	Frequency	3730.02	3840	3949.98
50	Channel	648334	656000	663666
	Frequency	3725.01	3840	3954.99
40	Channel	648000	656000	664000
	Frequency	3720	3840	3960
30	Channel	647668	656000	664332
	Frequency	3715.02	3840	3964.98
20	Channel	647334	656000	664666
	Frequency	3710.01	3840	3969.99



5G n77 Channel and Frequency List for Part 27Q				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	-	633334	-
	Frequency	-	3500.01	-
90	Channel	633000	633334	633666
	Frequency	3495	3500.01	3504.99
80	Channel	632668	633334	634000
	Frequency	3490.02	3500.01	3510
70	Channel	632334	633334	634332
	Frequency	3485.01	3500.01	3514.98
60	Channel	632000	633334	634666
	Frequency	3480	3500.01	3519.99
50	Channel	631668	633334	635000
	Frequency	3475.02	3500.01	3525
40	Channel	631334	633334	635332
	Frequency	3470.01	3500.01	3529.98
30	Channel	631000	633334	635666
	Frequency	3465	3500.01	3534.99
20	Channel	630668	633334	636000
	Frequency	3460.02	3500.01	3540

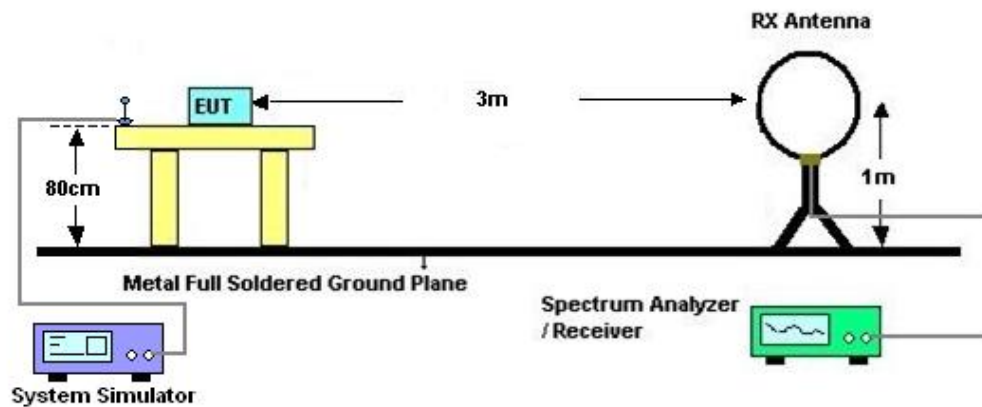
3 Radiated Test Items

3.1 Measuring Instruments

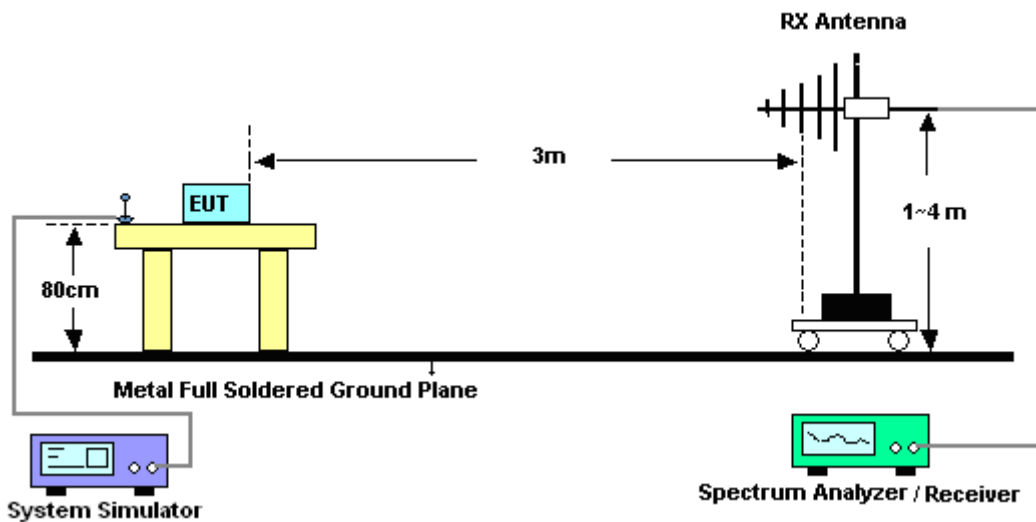
See list of measuring instruments of this test report.

3.2 Test Setup

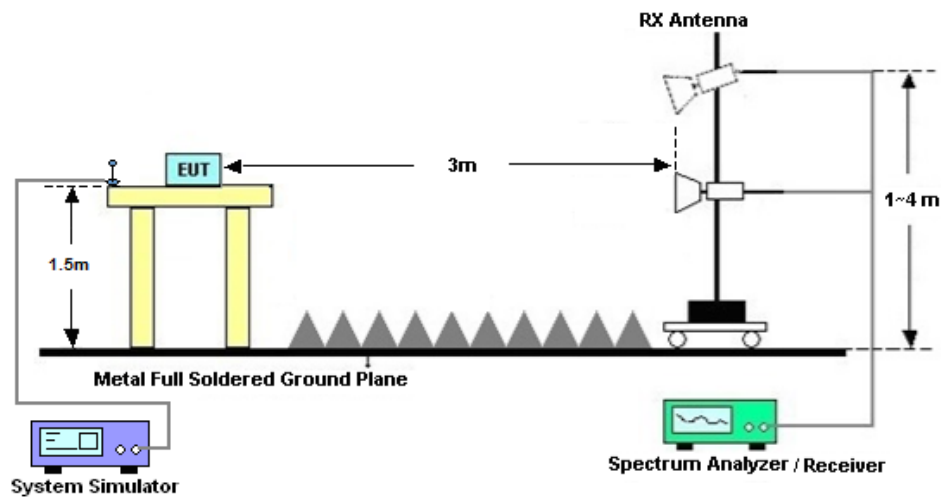
3.2.1 For radiated test below 30MHz



3.2.2 For radiated test from 30MHz to 1GHz



3.2.3 For radiated test above 1GHz



3.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix A.



3.4 Radiated Spurious Emission

3.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26.

For 5G NR n2, n5, n25, n66, n71, n77(27O)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For 5G NR n77(27Q)

The power of any emission outside of the authorized operating frequency ranges shall not exceed -13 dBm/MHz.

For 5G NR n41

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB.

For 5G NR n48

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least -40dBm / MHz.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2023	May 09, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	May 09, 2024	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 19, 2023	May 09, 2024	Aug. 18, 2024	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00251694	1GHz~18GHz	Jul. 12, 2023	May 09, 2024	Jul. 11, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	May 09, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	May 09, 2024	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2024	May 09, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18G A	060840	1Ghz-18Ghz	Oct. 10, 2023	May 09, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	May 09, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 09, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 09, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 09, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty 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 compared directly to specified limit to determine compliance.

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.83 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.83 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.82 dB
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Appendix A. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Carry Xu	Temperature :	23~25°C
		Relative Humidity :	41~42%

Pre-scanned harmonic for the different antenna combinations, we choose the worst antenna mode to perform final test and record in the report.

ULCA_n2A-n77A (ANT0+1)								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n2 BW 40MHz Middle 1RB0,QPSK	3720	-53.28	-13	-40.28	-65.54	2.64	14.90	H
	5580	-52.00	-13	-39.00	-63.86	2.94	14.80	H
	7455	-50.82	-13	-37.82	-60.59	3.39	13.16	H
	3720	-52.79	-13	-39.79	-65.05	2.64	14.90	V
	5580	-52.64	-13	-39.64	-64.50	2.94	14.80	V
	7455	-50.79	-13	-37.79	-60.56	3.39	13.16	V
NR n77 BW 100MHz Middle 1RB0,QPSK	7594	-62.09	-13	-49.09	-72.30	3.03	13.24	H
	11389	-60.51	-13	-47.51	-69.96	3.56	13.01	H
	15184	-59.38	-13	-46.38	-68.90	3.92	13.44	H
	7594	-62.29	-13	-49.29	-72.50	3.03	13.24	V
	11389	-59.64	-13	-46.64	-69.09	3.56	13.01	V
	15184	-59.91	-13	-46.91	-69.43	3.92	13.44	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

ULCA_n5A-n77A (ANT0+1)								
Channel	Frequency (MHz)	ERP/EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n5 BW 20MHz Middle 1RB0,QPSK	1655	-62.85	-13	-49.85	-69.82	1.58	10.70	H
	2485	-58.23	-13	-45.23	-66.48	2.102	12.50	H
	3310	-56.96	-13	-43.96	-65.85	2.856	13.90	H
	1655	-62.10	-13	-49.10	-69.07	1.58	10.70	V
	2485	-56.18	-13	-43.18	-64.43	2.10	12.50	V
	3310	-56.62	-13	-43.62	-65.51	2.86	13.90	V
NR n77 BW 100MHz Middle 1RB0,QPSK	7596	-62.08	-13	-49.08	-72.29	3.03	13.24	H
	11388	-60.61	-13	-47.61	-70.06	3.56	13.01	H
	15180	-59.41	-13	-46.41	-68.93	3.92	13.44	H
	7596	-61.81	-13	-48.81	-72.02	3.03	13.24	V
	11388	-60.97	-13	-47.97	-70.42	3.56	13.01	V
	15180	-59.87	-13	-46.87	-69.39	3.92	13.44	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



ULCA_n25A-n41A (ANT0+8)								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n25 BW 40MHz Middle 1RB0,QPSK	3735	-68.56	-13	-55.56	-80.82	2.64	14.90	H
	5595	-67.24	-13	-54.24	-79.10	2.94	14.80	H
	7455	-61.82	-13	-48.82	-71.59	3.39	13.16	H
	3735	-69.55	-13	-56.55	-81.81	2.64	14.90	V
	5595	-66.98	-13	-53.98	-78.84	2.94	14.80	V
	7455	-60.74	-13	-47.74	-70.51	3.39	13.16	V
NR n41 BW 100MHz Middle 1RB0,QPSK	5100	-66.40	-25	-41.40	-76.61	3.03	13.24	H
	7650	-62.33	-25	-37.33	-71.78	3.56	13.01	H
	10185	-61.54	-25	-36.54	-71.06	3.92	13.44	H
	5100	-66.78	-25	-41.78	-76.99	3.03	13.24	V
	7650	-62.17	-25	-37.17	-71.62	3.56	13.01	V
	10185	-61.30	-25	-36.30	-70.82	3.92	13.44	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

ULCA_n41A-n66A (ANT8+0)								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n41 BW 100MHz Middle 1RB0,QPSK	5100	-65.77	-25	-40.77	-75.98	3.03	13.24	H
	7650	-61.24	-25	-36.24	-70.69	3.56	13.01	H
	10185	-60.95	-25	-35.95	-70.47	3.92	13.44	H
	5100	-66.20	-25	-41.20	-76.41	3.03	13.24	V
	7650	-61.75	-25	-36.75	-71.20	3.56	13.01	V
	10185	-61.78	-25	-36.78	-71.30	3.92	13.44	V
NR n66 BW 40MHz Middle 1RB0,QPSK	3450	-68.80	-13	-55.80	-79.54	2.604	13.34	H
	5175	-66.01	-13	-53.01	-76.52	3.011	13.52	H
	6900	-59.63	-13	-46.63	-69.83	3.271	13.47	H
	3450	-69.54	-13	-56.54	-80.28	2.604	13.34	V
	5175	-66.36	-13	-53.36	-76.87	3.011	13.52	V
	6900	-63.70	-13	-50.70	-73.90	3.271	13.47	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

ULCA_n48A-n66A (ANT1+0)								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n48 BW 40MHz Middle 1RB0,QPSK	7209	-63.29	-40	-23.29	-74.75	2.84	14.30	H
	10817	-61.10	-40	-21.10	-71.04	3.49	13.43	H
	14425	-60.27	-40	-20.27	-70.51	3.85	14.09	H
	7209	-63.57	-40	-23.57	-75.03	2.84	14.30	V
	10817	-61.15	-40	-21.15	-71.09	3.49	13.43	V
	14425	-60.16	-40	-20.16	-70.40	3.85	14.09	V
NR n66 BW 40MHz Middle 1RB0,QPSK	3450	-55.83	-13	-42.83	-66.57	2.604	13.34	H
	5175	-52.42	-13	-39.42	-62.93	3.011	13.52	H
	6915	-52.51	-13	-39.51	-62.71	3.271	13.47	H
	3450	-56.05	-13	-43.05	-66.79	2.604	13.34	V
	5175	-52.53	-13	-39.53	-63.04	3.011	13.52	V
	6915	-52.60	-13	-39.60	-62.80	3.271	13.47	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



ULCA_n66A-n77A (ANT0+1)								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n66 BW 40MHz Middle 1RB0,QPSK	3450	-55.62	-13	-42.62	-66.36	2.604	13.34	H
	5175	-52.32	-13	-39.32	-62.83	3.011	13.52	H
	6915	-52.49	-13	-39.49	-62.69	3.271	13.47	H
	3450	-56.47	-13	-43.47	-67.21	2.604	13.34	V
	5175	-52.13	-13	-39.13	-62.64	3.011	13.52	V
	6915	-52.77	-13	-39.77	-62.97	3.271	13.47	V
NR n77 BW 100MHz Middle 1RB0,QPSK	7594	-62.04	-13	-49.04	-72.25	3.03	13.24	H
	11389	-60.35	-13	-47.35	-69.80	3.56	13.01	H
	15184	-59.36	-13	-46.36	-68.88	3.92	13.44	H
	7594	-62.22	-13	-49.22	-72.43	3.03	13.24	V
	11389	-60.69	-13	-47.69	-70.14	3.56	13.01	V
	15184	-59.74	-13	-46.74	-69.26	3.92	13.44	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

ULCA_n71A-n77A (ANT0+1)								
Channel	Frequency (MHz)	ERP/EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
NR n71 BW 20MHz Middle 1RB0,QPSK	1345	-65.41	-13	-52.41	-67.16	1.02	4.92	H
	2015	-59.91	-13	-46.91	-61.88	1.27	5.39	H
	2685	-56.87	-13	-43.87	-59.80	1.49	6.57	H
	1345	-64.71	-13	-51.71	-66.46	1.02	4.92	V
	2015	-59.21	-13	-46.21	-61.18	1.27	5.39	V
	2685	-56.44	-13	-43.44	-59.37	1.49	6.57	V
NR n77 BW 100MHz Middle 1RB0,QPSK	7596	-62.60	-13	-49.60	-72.81	3.03	13.24	H
	11388	-60.44	-13	-47.44	-69.89	3.56	13.01	H
	15180	-59.19	-13	-46.19	-68.71	3.92	13.44	H
	7596	-62.55	-13	-49.55	-72.76	3.03	13.24	V
	11388	-61.17	-13	-48.17	-70.62	3.56	13.01	V
	15180	-59.72	-13	-46.72	-69.24	3.92	13.44	V

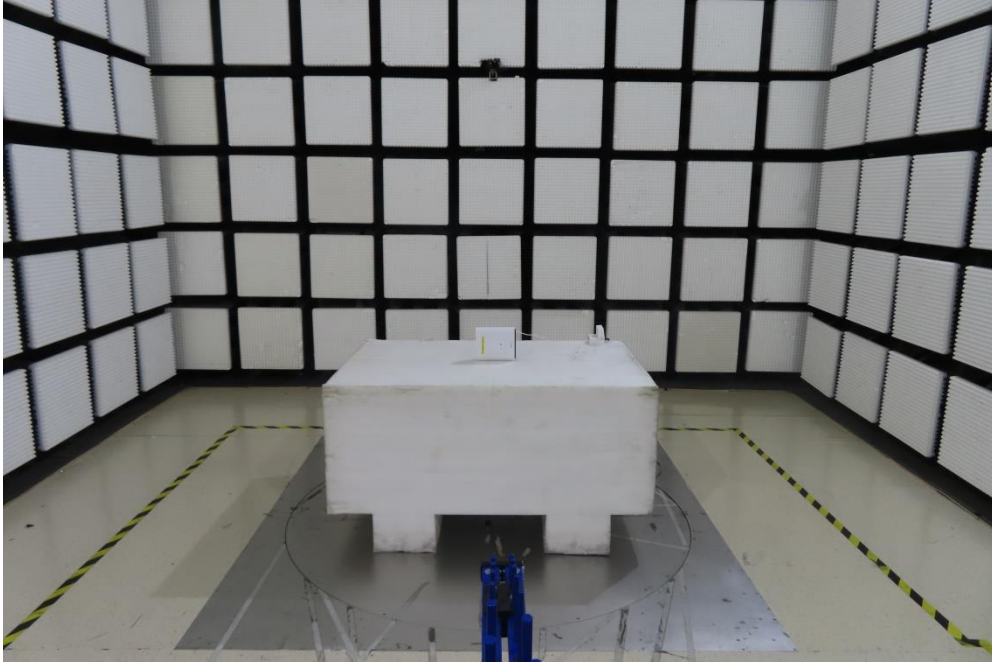
Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Appendix B. Setup Photographs

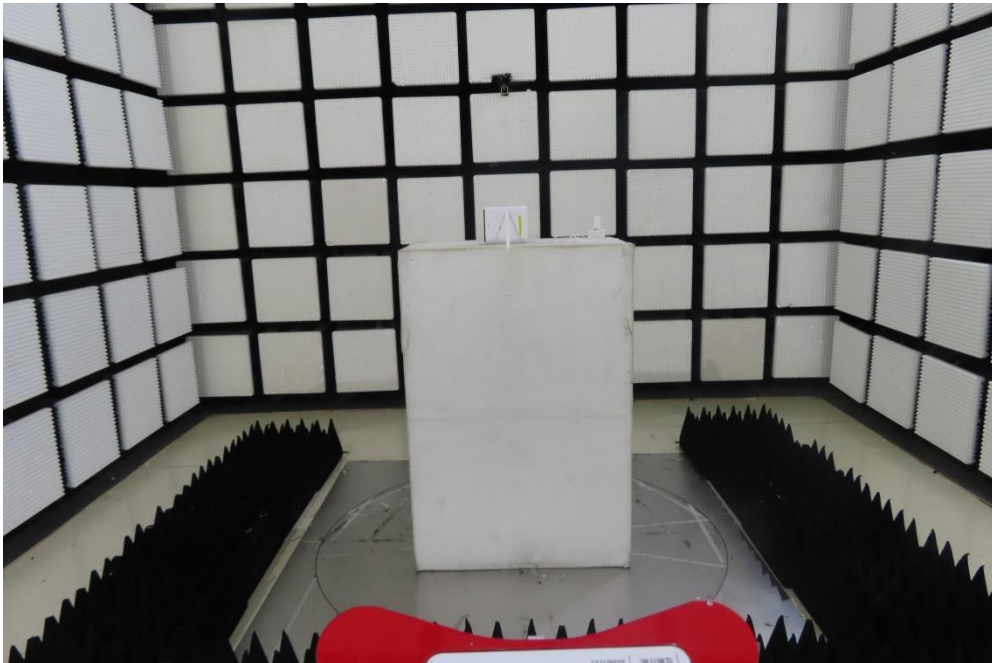
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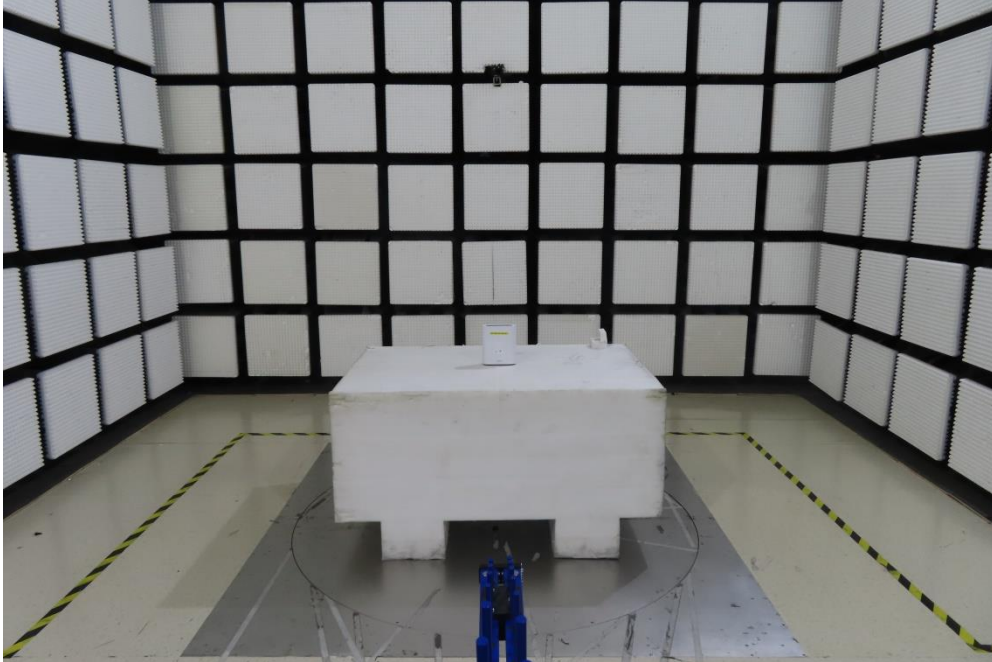
Z Plane for ULCA_n41A-n66A & n25A-n41A

LF



HF



Y Plane for the other ULCA combinations**LF****HF**