

RF Exposure Evaluation Declaration

FCC ID: 2AD8UAHFID01

Applicant: Nokia Solutions and Networks, OY

Application Type: Certification

Product: AirScale Indoor Radio ASiR-pRRH

Model No.: AHFID

Brand Name: Nokia

Test Procedure(s): KDB 447498 D01v06

Reviewed By:

Paddy Chen

(Paddy Chen)

Approved By:

Chenz Ker

(Chenz Ker)



Testing Laboratory
3261

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.



Revision History

Report No.	Version	Description	Issue Date	Note
1905TW0105-U3	Rev. 01	Initial Report	06-24-2019	Valid

§2.1033 General Information

Applicant:	Nokia Solutions and Networks, OY
Applicant Address:	2000 W. Lucent Lane, Naperville, Illinois, United States, 60563
Manufacturer:	Nokia Solutions and Networks, OY
Manufacturer Address:	2000 W. Lucent Lane, Naperville, Illinois, United States, 60563
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- MRT facility is a FCC registered (Reg. No. 153292) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film.
- MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (TAF) under the American Association for Laboratory Accreditation Program (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC, Industry Taiwan, EU and TELEC Rules.

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	AirScale Indoor Radio ASiR-pRRH
Model No.:	AHFHIA
Brand Name:	Nokia
Test Device Serial No.:	NH184600325
Hardware Version:	X12
Software Version:	FL18A
LTE Specification	
LTE Operating Band (s):	Band 2 / 66
Modulation Type:	QPSK, 16QAM, 64QAM, 256QAM
T _x Frequency Range	Band 2: 1930 ~ 1990 MHz; Band 66: 2110 ~ 2200 MHz
R _x Frequency Range	Band 2: 1850 ~ 1910 MHz; Band 66: 1710 ~ 1780 MHz
WCDMA Specification	
WCDMA Operating Band (s):	Band 2 / 66
Modulation Type:	QPSK, 16QAM
T _x Frequency Range	Band 2: 1930 ~ 1990 MHz; Band 66: 2110 ~ 2200 MHz
R _x Frequency Range	Band 2: 1850 ~ 1910 MHz; Band 66: 1710 ~ 1780 MHz

1.2. Antenna Information

Band Support	Antenna Type	Model	Antenna Gain
LTE Band 2, WCDMA Band 2	Omni Internal Antenna	6744	ANT 0: 4.4dBi ANT 1: 4.9dBi
LTE Band 66, WCDMA Band 66			ANT 0: 5.5dBi ANT 1: 4.8dBi

2. RF Exposure Evaluation

2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

r = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

Product	AirScale Indoor Radio ASiR-pRRH
Test Item	RF Exposure Evaluation (For General Population)

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Safety Distance (cm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
LTE Band 2	1930 ~ 1990	32.96	0.20	0.3933	1
LTE Band 66	2110 ~ 2200	33.05	0.20	0.4015	1
WCDMA Band 2	1930 ~ 1990	33.86	0.20	0.4839	1
WCDMA Band 66	2110 ~ 2200	32.21	0.20	0.3309	1

Product	AirScale Indoor Radio ASiR-pRRH
Test Item	RF Exposure Evaluation (For Occupational)

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Safety Distance (cm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
LTE Band 2	1930 ~ 1990	32.96	0.20	0.3933	5
LTE Band 66	2110 ~ 2200	33.05	0.20	0.4015	5
WCDMA Band 2	1930 ~ 1990	33.86	0.20	0.4839	5
WCDMA Band 66	2110 ~ 2200	32.21	0.20	0.3309	5

2.3. Summary of Test Result

The maximum calculations of above situations

Model	Configuration	The formula of calculated the MPE (mW/cm ²)	Calculation Power Density (mW/cm ²)	Limit	Result
General Population	WCDMA Band 2 & Band 66	0.4839 + 0.3309	0.8148	1	Pass
Occupational		0.4839 + 0.3309	0.8148	5	Pass

The wireless device described within this report has been shown to be capable of compliance with basic restrictions related to human exposure to electromagnetic fields for both General public and Occupational. The calculations shown in this report were made in accordance the procedures specified in the applied test specifications

Required Compliance Boundary (cm)	
General Population	Occupational
20	20

_____ The End _____