

FCC RF Exposure Test Report

Report No. : PSU-NQN2502170113SA01

Applicant : Beijing InHand Networks Technology Co., Ltd.

Address : Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing China

Product : 5G Fixed Wireless Access

Brand Name : inhand

Model Name : FWA12-NANR

FCC ID : 2AANY-FWA12

Standards : FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

Date of Testing : Jan.17, 2025 ~ Apr.08, 2025

The FCC Site Registration No. : 434559

The Designation No. : CN1325

CERTIFICATION: The above equipment have been tested by **Huarui 7Layers High Technology (Suzhou) Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by A2LA or any government agencies.

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Table of Contents

RELEASE CONTROL RECORD.....	3
1. DESCRIPTION OF EQUIPMENT UNDER TEST	4
2. MPE(MAXIMUM PERMISSIBLE EXPOSURE) ASSESSMENT	5
2.1 INTRODUCTION	5
2.2 RF RADIATION EXPOSURE LIMITS	5
2.3 MPE ASSESSMENT METHOD	6
2.4 MPE CALCULATION FOR STANDALONE OPERATIONS	6
3. INFORMATION ON THE TESTING LABORATORIES	8



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FCC RF Exposure Test Report

Release Control Record

Report No.	Reason for Change	Date Issued
PSU-NQN2502170113SA01	Original release	Apr.08, 2025

1. Description of Equipment Under Test

EUT Type	5G Fixed Wireless Access
Brand Name	inhand
Model Name	FWA12-NANR
Tx Frequency Bands (Unit: MHz)	LTE: Band 2/4/5/7/12/13/14/17/25/26/30/38/41/42/48/66/70/71 NR: n2/n5/n7/n12/n13/n14/n25/n26/n30/n38/n41/n48/n66/n71/n77/n78 WIFI2.4G:2.410GHz~2.475GHz WIFI5G:5180 ~ 5240MHz, 5745 ~ 5825MHz
Uplink Modulations	LTE: QPSK, 16QAM, 64QAM,256 QAM NR: DFT-s-OFDM(Pi/2BPSK,QPSK,16QAM,64QAM,256QAM); CP-OFDM(QPSK,16QAM,64QAM,256QAM) WIFI2.4G: DSSS, OFDM, OFDMA WIFI5G: OFDM, OFDMA
HW VERSION	V1.6
SW VERSION	V2.0
Antenna Type	5G external antenna with 2.22dBi(Max) gain for LTE B5/LTE CA_5B/LTE B26 5G external antenna with 2.36dBi(Max) gain for LTE B2/ LTE B25 5G external antenna with 3.62dBi(Max) gain for LTE B7 5G external antenna with 0.48dBi(Max) gain for LTE B30 5G external antenna with 1.21dBi(Max) gain for LTE B12 5G external antenna with 1.68dBi(Max) gain for LTE B13 5G external antenna with 1.45dBi(Max) gain for LTE B17/B71 5G external antenna with 2.78dBi(Max) gain for LTE B4/LTE B66/LTE CA_66B/LTE CA_66C/LTE B70 5G external antenna with 2.93dBi(Max) gain for LTE B38 5G external antenna with 3.62dBi(Max) gain for LTE B41 5G external antenna with 4.82dBi(Max) gain for LTE B42 5G external antenna with 3.62dBi(Max) gain for LTE CA 7C 5G external antenna with 2.93dBi(Max) gain for LTE CA 38C 5G external antenna with 3.62dBi(Max) gain for LTE CA 41C 5G external antenna with 4.82dBi(Max) gain for LTE CA 42C 5G external antenna with 1.68dBi(Max) for LTE B14 5G external antenna with 2.93dBi(Max) gain for LTE B38 5G external antenna with 3.62dBi(Max) gain for LTE B41 5G external antenna with 4.82dBi(Max) gain for LTE B42 Built-in FPC antenna with -1.1dBi(Max) gain LTE CA 48/LTE CA 48C/NR 48/NR 48B 5G external antenna with 2.22dBi(Max) gain for NR Band n5/ CA_n5B 5G external antenna with 3.62dBi(Max) gain for NR Band n7/ n41/CA_n7B/CA_n41C 5G external antenna with 0.48dBi(Max) gain for NR Band n30 5G external antenna with 1.21dBi(Max) gain for NR Band n12 5G external antenna with 1.68dBi(Max) gain for NR Band n13/ n14 5G external antenna with 1.82dBi(Max) gain for NR Band n26 5G external antenna with 1.45dBi(Max) gain for NR Band n71 5G external antenna with 2.78dBi(Max) gain for NR Band n66/ n70 5G external antenna with 2.36dBi(Max) gain for NR Band n2/ n25 5G external antenna with 2.93dBi(Max) gain for NR Band n38 Built-in FPC antenna with -1.1dBi(Max) gain for NR Band n77/n78 Built-in FPC Antenna with 4.13dBi gain for 2412~2462MHz Built-in FPC Antenna with 4.9dBi for 5180 ~ 5240MHz Built-in FPC Antenna with 4.9dBi for 5745 ~ 5825MHz

Note:

- *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
- The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

2. MPE(Maximum Permissible Exposure) Assessment

2.1 Introduction

According to 47 CFR §2.1091, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitting antenna and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 cm separation requirement. The limits to be used for MPE evaluation are specified in §1.1310. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

2.2 RF Radiation Exposure Limits

According to 47 CFR §1.1310, the criteria listed in below table shall be used to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093.

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (min)
(A) Limits for Occupational / Controlled Exposures				
0.3 – 3.0	614	1.63	100	6
3.0 – 30	1842/f	4.89/f	900/f ²	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	-	-	f/300	6
1500 – 100000	-	-	5	6
(B) Limits for General Population / Uncontrolled Exposures				
0.3 – 1.34	614	1.63	100	30
1.34 – 30	824/f	2.19/f	180/f ²	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	-	-	f/1500	30
1500 – 100000	-	-	1.0	30

Limits for maximum permissible exposure (MPE)

Notes:

1. f = frequency in MHz
2. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided they are made aware of the potential for exposure.
3. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

2.3 MPE Assessment Method

Calculations can be made to predict RF field strength and power density levels around typical RF sources. For example, in the case of a single radiating antenna, a prediction for power density in the far-field of the antenna can be made by use of the general Equations below. This equation is generally accurate in the far-field of an antenna but will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction.

$$\text{Power Density (S)} = \frac{PG}{4\pi R^2} = \frac{\text{EIRP}}{4\pi R^2}$$

Where

S = Power Density, unit in mW/cm²

P = Power input to the antenna, unit in mW

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna, unit in cm

EIRP = Effective isotropically radiated power

2.4 MPE Calculation for Standalone Operations

The manufacturer expects that the radiated component of this device will not close to the human body during normal usage and the warning statement was also stated in the user instruction. Since the transmitting antenna will be kept at least 20 cm away from the human body, the MPE level is calculated based on this condition and the result is listed in below table.

RF Exposure Evaluation Results:

Band	Freq. (MHz)	Maximum Power (dBm)	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP(mW)	Power Density (mW/cm ²)	Power Density/ Limit
LTE B2	1882.5	23.13	2.36	25.49	353.997	0.070	0.070
LTE B4	1777.5	22.89	2.78	25.67	368.978	0.073	0.073
LTE B5	846.5	23.45	2.22	25.67	368.978	0.073	0.132
LTE B7	2565	23.53	3.62	27.15	518.800	0.103	0.103
LTE B12	711	23.59	1.21	24.80	301.995	0.060	0.129
LTE B13	779.5	23.63	1.68	25.31	339.625	0.068	0.130
LTE B14	793	23.39	1.68	25.07	321.366	0.064	0.121
LTE B17	713.5	23.75	1.45	25.20	331.131	0.066	0.138
LTE B25	1882.5	23.44	2.36	25.80	380.189	0.076	0.076
LTE B26	819	23.83	2.22	26.05	402.717	0.080	0.147
LTE B30	2307.5	23.24	0.48	23.72	235.505	0.047	0.047
LTE B38	2687.5	25.70	2.93	28.63	729.458	0.145	0.145
LTE B41	2687.5	26.15	3.62	29.77	948.418	0.189	0.189
LTE B42	3597.5	22.40	4.82	27.22	527.230	0.105	0.105
LTE B48	3552.5	23.39	-1.1	22.29	169.434	0.034	0.034
LTE B66	1777.5	22.88	2.78	25.66	368.129	0.073	0.073
LTE B70	2007.5	23.12	2.78	25.90	389.045	0.077	0.058
LTE B71	665.5	23.32	1.45	24.77	299.916	0.060	0.134
NR2	1912.5	24.06	2.36	26.42	438.531	0.087	0.087
NR5	836	24.93	2.22	27.15	518.800	0.103	0.185
NR7	2535	23.61	3.62	27.23	528.445	0.105	0.105
NR12	708.5	24.22	1.21	25.43	349.140	0.069	0.147
NR13	782	23.93	1.68	25.61	363.915	0.072	0.139
NR14	795.5	23.62	1.68	25.30	338.844	0.067	0.127
NR25	1907.5	23.86	2.36	26.22	418.794	0.083	0.083
NR26	824	24.21	1.82	26.03	400.867	0.080	0.145
NR30	2310	23.38	0.48	23.86	243.220	0.048	0.048
NR38	2590	26.32	2.93	29.25	841.395	0.167	0.167
NR41	2670	28.99	3.62	32.61	1823.896	0.363	0.363
NR48	3624.99	16.72	-1.1	15.62	36.475	0.007	0.007
NR66	1772.5	24.25	2.78	27.03	504.661	0.100	0.100
NR70	2007.5	23.61	2.78	26.39	435.512	0.087	0.065
NR71	688	24.82	1.45	26.27	423.643	0.084	0.184
NR77	3964.98	29.03	-1.1	27.93	620.869	0.124	0.124
NR78	3964.98	29.35	-1.1	28.25	668.344	0.133	0.133
WIFI 2.4G	2462	18.53	4.13	22.66	184.502	0.037	0.037
WIFI 5.2G	5180	17.48	4.9	22.38	172.982	0.034	0.034
WIFI 5.8G	5745	17.90	4.9	22.80	190.546	0.038	0.038

Simultaneous Transmission Result

Power Density1(NR41) / Limit	Powe Density2(WIFI 2.4G) / Limit	Σ (Power Density / Limit)
0.363	0.038	0.401

Note: Simultaneous Transmission Limit = $\text{Power_1} / \text{Limit_1} + \text{Power_2} / \text{Limit_2} < 1$.

3. Information on the Testing Laboratories

We, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

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Accredited Test Lab Cert 6613.01

If you have any comments, please feel free to contact us at the following:

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