

Report No.: XEWM2309000484RG02

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# **TEST REPORT**

Application No.: XEWM2309000484RG

**Applicant:** Beijing InHand Networks Technology Co., Ltd.

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

**Manufacturer:** Beijing InHand Networks Technology Co., Ltd.

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

**EUT Description:** 5G Outdoor Unit

Model No.: ODU2x02-NATM (Where 'x' represents the numbers '0-9')

Trade Mark: inhand

FCC ID: 2AANY-ODUNATM Standards: 47 CFR Part 2.1091

FCC KDB 447498 D01 v06

**Date of Receipt:** 2023/09/19 **Date of Issue:** 2023/10/17

Test Result: PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Peter Tan
Regulatory Technical Manager



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#### 1 Version

Revision Record						
Version Chapter Date Modifier Remark						
01		2023/10/17		Original		

Prepared By	(Leah Chen) / Test Engineer		
Checked By	Andy Yao) /Reviewer		



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#### Remark:

According to the Declaration letter from client, Models No.: ODU2x02-NATM, Where 'x' represents the numbers '0-9'.

Therefore in this report only the Model No.( ODU2002-NATM ) was recalculated, and internal wiring were identical for all above items. Only different on model No. for marketing requirement.



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### 2 General Information

#### 2.1 Client Information

Applicant:	Beijing InHand Networks Technology Co., Ltd.		
Address of Applicant:	Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing		
Manufacturer:	Beijing InHand Networks Technology Co., Ltd.		
Address of Manufacturer:	Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing		

### 2.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### •A2LA (Certificate No. 4854.01)

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

#### • Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

#### FCC –Designation Number: CN1337

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410





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### 2.3 General Description of EUT

EUT Description:	5G Outdoor Unit							
Model No.:	ODU2x02-NATM	ODU2x02-NATM (Where 'x' represents the numbers '0-9')						
Trade Mark:	inhand							
Hardware Version:	V1.2							
Software Version:	V2.0							
Power Supply:	POE 50V	POE 50V						
Antenna Type:	⊠ External, □ Ir	itegrated						
	LTE Band 2:	6.04dBi(Ant3)	LTE Band 4:	5.15dBi(Ant3)				
	LTE Band 5:	1.85dBi(Ant8)	LTE Band 12:	1.86dBi(Ant8)				
	LTE Band 41:	2.77dBi(Ant3)	LTE Band 66:	5.43dBi(Ant3)				
	LTE Band 71:	1.29dBi(Ant8)						
	LTE CA_2C:	6.04dBi(Ant3)	LTE CA_41C:	2.77dBi(Ant3)				
	NR Band n25:	C 04dD://\_t2\	NR Band n41:	2.77dBi(Ant3);				
	INIX Danu 1125.	6.04dBi(Ant3)	INIX Danu 1141.	3.52dBi(Ant8)				
	NR Band n66:	5.43dBi(Ant3)	NR Band n71:	1.29dBi(Ant8)				
	LTE UL CA:							
Antenna Gain:	LTE UL CA_2; LTE UL CA_41C; LTE UL CA_2A_4A;							
	LTE UL CA_2A_12A; LTE UL CA_2A_66A: LTE UL CA_12A_66A							
	ENDC:							
	DC_12A_n25; DC_66A_n25; DC_2A_n41; DC_41A_n41; DC_66A_n41; DC_2A_n66; DC_12A_n66; DC_2A_n71; DC_66A_n71							
	NR CA:							
	NR CA n25A n41A; NR CA n25A n66A; NR CA n25A n71A;							
	NR CA_n41A_n66A; NR CA_n41A_n71A; NR CA_n66A_n71A;							
	2.4G WIFI: 4.21dBi(Ant0)							
	Note:							
	The antenna gain are derived from the gain information report provided by the manufacturer.							
HPUE Power Class:	LTE Band 41							
Feature:	UL 2*2 MIMO: NR Band n41							
Remark:								



suitability, reliability or/and integrity of the information.

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## 3 RF Exposure Evaluation

## 3.1 RF Exposure Compliance Requirement

#### **3.1.1 Limits**

Frequency range (MHz)				Averaging time (minutes)					
(A) Limits for Occupational/Controlled Exposures									
0.3-3.0	614	1.63	*(100)	6					
3.0-30	1842/f	4.89/f	*(900/f2)	6					
30-300	61.4	0.163	1.0	6					
300-1500	/	1	f/300	6					
1500-100,000	/	1	5	6					
	(B) Limits for General Population/Uncontrolled Exposure								
0.3-1.34	614	1.63	*(100)	30					
1.34-30	824/f	2.19/f	*(180/f2)	30					
30-300	27.5	0.073	0.2	30					
300-1500	/	1	f/1500	30					
1500-100,000		1	1.0	30					

F=frequency in MHz

RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

Friis Formula

Friis transmission formula: Pd = (Pout\*G)/(4\* Pi \* R<sup>2</sup>)

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd id the limit of MPE, 1 mW/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.



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<sup>\*=</sup>Plane-wave equivalent power density



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#### 3.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually

#### 3.1.3 EUT RF Exposure Evaluation

Output Power Into Antenna & RF Exposure Evaluation Distance:

This confirmed that the device comply with MPE limit.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	MIMO Directional gain	Max Conducted Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	conclusion
LTE/CA Band 2	1850.7	6.04	N/A	24.50	30.54	33.00	0.2253	1.0000	Pass
LTE Band 4	1710.7	5.15	N/A	24.50	29.65	30.00	0.1835	1.0000	Pass
LTE Band 5	824.7	1.85	N/A	24.50	24.20	38.45	0.0858	0.5498	Pass
LTE Band 12	699.7	1.86	N/A	24.50	24.21	34.77	0.0860	0.4665	Pass
LTE/CA Band 41	2498.5	2.77	N/A	24.50	27.27	33.00	0.1061	1.0000	Pass
LTE/CA Band 41 (HPUE)	2498.5	2.77	N/A	27.50	30.27	33.00	0.2117	1.0000	Pass
LTE Band 66	1710.7	5.43	N/A	24.50	29.93	30.00	0.1958	1.0000	Pass
LTE Band 71	665.5	1.29	N/A	24.50	23.64	34.77	0.0755	0.4437	Pass
NR Band n25	1852.5	6.04	N/A	24.50	30.54	33.00	0.2253	1.0000	Pass
NR Band n41	2501.01	3.52	N/A	24.50	28.02	33.00	0.1261	1.0000	Pass
NR Band n41 (MIMO)	2501.01	3.52	3.52	27.50	31.02	33.00	0.2516	1.0000	Pass
NR Band n66	1712.5	5.43	N/A	24.50	29.93	30.00	0.1958	1.0000	Pass
NR Band n71	665.5	1.29	N/A	24.50	23.64	34.77	0.0755	0.4437	Pass
2.4G WiFi	2412.0	4.21	N/A	22.00	26.21	30.00	0.0831	1.0000	Pass



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Due to the EUT support ENDC, NR CA and CA:
Both LTE and NR/LTE band can transmit simultaneously, the formula of the calculated the MPE is:

$$\sum_{i=1}^{n} \frac{S_{E_{i}}(dutyfactor)}{MPE_{E_{i}}} < 1$$

NOTE The corresponding MEs must be expressed in terms of power density in the above summation Therefore, the worst-case(DC\_2A\_n41) situation is 0.2253+0.2516=0.4769,which is less than "1", this confirmed that the device comply with MPE limit.



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#### 3.1.4 Exposure calculations for multiple sources

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE in accordance with the provisions of Table(A) and Table(B). To comply with the MPE, the fraction of the MPE in terms of E2, H2 (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity.

In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^{n} \frac{S_i}{MPE_i} \le 1$$

The product also has multiple transmitters The Simultaneous Transmission Possibilities are as below:

Simultaneous Tx Combination	Configuration	
1	WWAN+ WiFi 2.4G	

No.	Mode	Power Density (mW/cm²)	MPE Limit (mW/cm²)	Result Ratio	Total Ratio	Limit	Result
1	NR Band n41(MIMO)	0.2516	1	0.2516	0.3347	1.0000 Pass	Door
	WiFi 2.4G	0.0831	1.0000	0.0831	0.3347	1.0000	Pass

Remark: This WWAN Band was recalculated on worst Band.

---End of Report---



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