

Report No.: XEWM2309000484RG02

Rev.: 01

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

Authorized Signature:



Peter Tan
Regulatory Technical Manager



SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Wireless Laboratory

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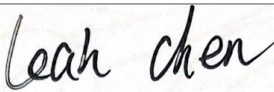
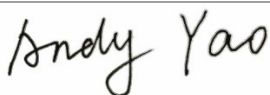
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1 Version

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 (Where 'x' represents the numbers '0-9')			
Trade Mark:				
Hardware Version:	V1.2			
Software Version:	V2.0			
Power Supply:	POE 50V			
Antenna Type:	☒ External, ☐ Integrated			
Antenna Gain:	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:	6.04dBi(Ant3)	NR Band n41:	2.77dBi(Ant3); 3.52dBi(Ant8)
	NR Band n66:	5.43dBi(Ant3)	NR Band n71:	1.29dBi(Ant8)
	LTE UL CA: 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:	As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.			

3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	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/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	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/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

F=frequency in MHz
 *=Plane-wave equivalent power density
 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

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, 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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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/cm ²)	Limit (mW/cm ²)	conclusion
LTE/CABand 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/CABand 41	2498.5	2.77	N/A	24.50	27.27	33.00	0.1061	1.0000	Pass
LTE/CABand 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:

$$\sum_{i=1}^n \frac{S_{E_i} (duty factor)}{MPE_{E_i}} < 1$$

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

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

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/cm ²)	MPE Limit (mW/cm ²)	Result Ratio	Total Ratio	Limit	Result
1	NR Band n41(MIMO)	0.2516	1	0.2516	0.3347	1.0000	Pass
	WiFi 2.4G	0.0831	1.0000	0.0831			

Remark: This WWAN Band was recalculated on worst Band.

---End of Report---



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