



RADIO EXPOSURE TEST REPORT

FCC ID : 2AXXQHNRM30

Equipment : Wi-Fi7 Tri-band AP Router

Brand Name : HUMAX NETWORKS

Model Name : HNRM30

Applicant : Humax Networks, INC
216, Hwangsaetul-ro, Bundang-gu, Seongnam-si, South Korea 13595

Manufacturer : Humax Networks, INC
216, Hwangsaetul-ro, Bundang-gu, Seongnam-si, South Korea 13595

Standard : 47 CFR Part 2.1091

The product was received on Aug. 06, 2024, and testing was started from Aug. 09, 2024 and completed on Feb. 13, 2025. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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Photographs of EUT v01



History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A1_1 Ver1.1

Page Number : 3 of 12
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Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

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 chapter "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.

Reviewed by: **Sam Chen**

Report Producer: **Cathy Chiu**



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2472	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
6GHz WLAN	5925-7125	5955-7115	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK
Zigbee	2400-2483.5	2405-2480	O-QPSK



1.2 Antenna Information

Ant.	Port				Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth /Zigbee					
1	4	1	-	-	Galtronics	60-3693-03-2	PCB	I-PEX	Note 1
2	3	2	-	-	Galtronics	60-3693-03-2	PCB	I-PEX	
3	2	3	-	-	Galtronics	60-3693-03-1	PCB	I-PEX	
4	1	4	-	-	Galtronics	60-3693-03-1	PCB	I-PEX	
5	-	-	3	-	Galtronics	60-3695-03-2	PCB	I-PEX	
6	-	-	2	-	Galtronics	60-3610-03	PCB	I-PEX	
7	-	-	1	-	Galtronics	60-3695-03-2	PCB	I-PEX	
8	-	-	4	-	Galtronics	60-3610-03	PCB	I-PEX	
9	-	-	-	1	Galtronics	AT6901	Printed	N/A	

Note 1:

Ant.	Antenna Gain (dBi)										
	WLAN 2.4GHz	WLAN 5GHz				WLAN 6GHz				Bluetooth/ Zigbee	GPS
1	3.68	3.73	3.25	3.77	3.16	-	-	-	-	-	-
2	2.53	3.43	3.21	3.82	3.85	-	-	-	-	-	-
3	3.76	5.24	5.15	5.05	4.94	-	-	-	-	-	-
4	4.06	4.80	4.41	3.96	3.87	-	-	-	-	-	-
5	-	-	-	-	-	4.67	4.16	4.37	4.01	-	-
6	-	-	-	-	-	3.76	3.24	4.42	4.17	-	-
7	-	-	-	-	-	4.63	5.06	4.31	4.58	-	-
8	-	-	-	-	-	3.75	3.58	3.93	4.38	-	-
9	-	-	-	-	-	-	-	-	-	3.83	-

Item	Directional Gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz			
		UNII 1	UNII 2A	UNII 2C	UNII 3
4T1S	4.75	5.35	5.86	5.30	5.17
4T2S	4.06	5.24	5.15	5.05	4.94
4T4S	4.06	5.24	5.15	5.05	4.94

Note 2: The above information (except gain of Ant. 1~4 and directional gain) was declared by the manufacturer.

Note 3: For 2.4GHz/5GHz, the antenna gain and directional gain are measured which follow the procedure of KDB 662911 D03.

**For 2.4GHz function:****For IEEE 802.11 b/g/n/VHT/ax/be (4TX/4RX):**

Port 1~4 can be used as transmitting/receiving antenna.

Port 1~4 could transmit/receive simultaneously.

For 5GHz function:**For IEEE 802.11 a/n/ac/ax/be (4TX/4RX):**

Port 1~4 can be used as transmitting/receiving antenna.

Port 1~4 could transmit/receive simultaneously.

For 6GHz function:**For IEEE 802.11 ax/be (4TX/4RX):**

Port 1~4 can be used as transmitting/receiving antenna.

Port 1~4 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

For Zigbee function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

1.3 Table for EUT Support Function

Function
AP
Mesh
Bridge

Note: The above information was declared by manufacturer.

1.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	NetBit	NBS42D120333VU	INPUT: 100-120V~, 50/60Hz, 1.0A OUTPUT: 12.0V, 3.33A
Others			
RJ-45 cable*1, non-shielded, 1.53m			

1.5 Applicable Standards

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

- ♦ 47 CFR Part 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310



1.6 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 51 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance

R between the person and the antenna / radiating structure, where $R > \lambda / 2 \pi$.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.
Note: R is in meters, f is in MHz.	



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	4.75	29.93	32.53	0.50	2009.093	51	C	4994.0	0.4025
5.2G;D1D	5.35	29.85	33.05	0.50	2264.644	51	C	4994.0	0.4536
5.3G;D1D	5.86	23.96	27.67	0.17	608.135	51	C	4994.0	0.1218
5.6G;D1D	5.30	23.93	27.08	0.50	572.796	51	C	4994.0	0.1147
5.8G;D1D	5.17	29.96	32.98	0.50	2228.435	51	C	4994.0	0.4464
6.2G;D1D	-	-	24.50	0.50	316.228	51	C	4994.0	0.0633
6.4G;D1D	-	-	22.50	0.50	199.526	51	C	4994.0	0.0400
6.7G;D1D	-	-	26.58	0.50	510.505	51	C	4994.0	0.1023
7.0G;D1D	-	-	21.50	0.50	158.489	51	C	4994.0	0.0317
2.4G;BT-LE	4.32	19.51	21.68	0.50	165.196	51	C	4994.0	0.0331
2.4G;G1D;Zigbee	4.32	19.36	21.53	0.50	159.588	51	C	4994.0	0.0320

**Simultaneous Transmission Analysis Mode:****Test Mode: Mode 1: WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Bluetooth**

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	4.75	29.93	32.53	0.50	2009.093	51	C	4994.0	0.4025
5.2G;D1D	5.35	29.85	33.05	0.50	2264.644	51	C	4994.0	0.4536
6.7G;D1D	-	-	26.58	0.50	510.505	51	C	4994.0	0.1023
2.4G;BT-LE	4.32	19.51	21.68	0.50	165.196	51	C	4994.0	0.0331
Sum TL Ratio_C	0.9915								
Ratio Limit	1								

Test Mode: Mode 2: WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Zigbee

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	4.75	29.93	32.53	0.50	2009.093	51	C	4994.0	0.4025
5.2G;D1D	5.35	29.85	33.05	0.50	2264.644	51	C	4994.0	0.4536
6.7G;D1D	-	-	26.58	0.50	510.505	51	C	4994.0	0.1023
2.4G;G1D	4.32	19.36	21.53	0.50	159.588	51	C	4994.0	0.0320
Sum TL Ratio_C	0.9904								
Ratio Limit	1								

Note: The above antenna gain was declared by manufacturer.

—————THE END—————