



RADIO EXPOSURE TEST REPORT

FCC ID : 2AHBN-AP34

Equipment : 802.11ax 6E Wireless Access Point

Brand Name : Juniper

Model Name : AP34

Applicant : Juniper Networks, Inc.
1133 Innovation Way Sunnyvale, California 94089
USA

Manufacturer : Juniper Networks, Inc.
1133 Innovation Way Sunnyvale, California 94089
USA

Standard : 47 CFR Part 2.1091

The product was received on Mar. 22, 2022, and testing was started from Mar. 26, 2022 and completed on Jun. 23, 2022. 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

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FA231832	01	Initial issue of report	Jul. 12, 2022
FA231832	02	Add the DG information for Radio 3.	Jul. 15, 2022



Summary of Test Result

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

Declaration of Conformity:

1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Measurement Uncertainty".

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: **Sam Chen**

Report Producer: **Wendy Pan**



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	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK
6E WLAN	5925-7125	5955-7115	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)



1.2 Antenna Information

Ant.	Port							Brand Name	Model Name	Ant. Type	Connector	Gain (dBi)
	WLAN 5GHz (Radio 1)	WLAN 2.4GHz (Radio 2)	WLAN 6GHz (Radio 3)	WLAN 2.4GHz (Radio 4)	WLAN 5GHz (Radio 4)	WLAN 6GHz (Radio 4)	BT (Radio 5)					
1	2	1	-	-	-	-	-	Juniper	AP34	PIFA	I-PEX	Note 2
2	1	2	-	-	-	-	-	Juniper	AP34	PIFA	I-PEX	
3	-	-	2	-	-	-	-	Juniper	AP34	PIFA	I-PEX	
4	-	-	1	-	-	-	-	Juniper	AP34	PIFA	I-PEX	
5	-	-	-	1	1	1	-	Juniper	AP34	PIFA	I-PEX	
6	-	-	-	-	-	-	1	Juniper	AP34	PIFA	N/A	

Note1: The above information was declared by manufacturer.

Note2:

Ant.	Gain (dBi)																		
	WLAN5GHz (Radio 1)				WLAN 2.4GHz (Radio 2)	WLAN 6GHz (Radio 3)				WLAN2.4GHz (Radio 4)	WLAN 5GHz (Radio 4)				WLAN 6GHz (Radio 4)				BT (Radio 5)
	UNII 1	UNII 2A	UNII 2C	UNII 3		UNII 5	UNII 6	UNII 7	UNII 8		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 6	UNII 7	UNII 8	
1	2.4	2.13	2.25	2.02	2.63	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	2.38	2.22	2.33	2.07	2.11	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	-	-	-	-	-	5.85	5.08	5.08	4.70	-	-	-	-	-	-	-	-	-	
4	-	-	-	-	-	5.85	5.08	5.08	4.70	-	-	-	-	-	-	-	-	-	
5	-	-	-	-	-	-	-	-	-	5.0	5.8	5.8	5.5	5.6	5.6	5.5	5.5	5.6	
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note3: WLAN 2.4GHz (Radio 2) and 5GHz (Radio 1): Maximum Directional Gain following KDB662911 D03.

The antenna report is provided in the operational description for this application.

Note4: The antenna gain of Radio 3, Radio 4 and Radio 5 were declared by manufacturer.

Note5: **For Radio 2**

For 2.4GHz:

For IEEE 802.11b/g/n/VHT/ax mode (2TX/2RX):

Port 1, Port 2 can be used as transmitting/receiving antenna.

Port 1, Port 2 could transmit/receive simultaneously.

For Radio 1

For 5GHz UNII 1~3:

For IEEE 802.11a/n/ac/ax mode (2TX/2RX):

Port 1, Port 2 can be used as transmitting/receiving antenna.

Port 1, Port 2 could transmit/receive simultaneously.

For Radio 3

For 6E UNII 5~8:

For IEEE 802.11ax mode (2TX/2RX):

Port 1, Port 2 can be used as transmitting/receiving antenna.

Port 1, Port 2 could transmit/receive simultaneously.

For scanning Radio 4

For 2.4GHz, IEEE 802.11b/g/n/VHT/ax mode (1TX/1RX):

For 5GHz UNII 1~3, IEEE 802.11a/n/ac/ax mode (1TX/1RX):

For 6E UNII 5~8, IEEE 802.11ax mode (1TX/1RX):

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

For Radio 5

Bluetooth (1TX/1RX):

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



1.3 Table for Radio function

Radio 1	Radio 2	Radio 3	Radio 4 (Scanning)	Radio 5
(WLAN 5GHz UNII 1~3)	(WLAN 2.4GHz)	(WLAN 6GHz)	(WLAN 2.4GHz)	(Bluetooth)
			(WLAN 5GHz)	
			(WLAN 6GHz)	

Note: The above information was declared by manufacturer.

1.4 Accessories

Bracket*1

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 41 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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	19.2R ² .

Note: R is in meters, f is in MHz.



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For Radio 1

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.2G;D1D	4.53	24.80	29.33	0.50	29.83	0.96161	41	0.04552	1.00000
5.3G;D1D	3.58	23.37	26.95	0.50	27.45	0.55590	41	0.02632	1.00000
5.6G;D1D	3.34	23.27	26.61	0.50	27.11	0.51404	41	0.02433	1.00000
5.8G;D1D	3.30	25.12	28.42	0.50	28.92	0.77983	41	0.03692	1.00000

For Radio 2

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;G1D	2.63	26.49	29.12	0.50	29.62	0.91622	41	0.04337	1.00000

For Radio 3

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
6.2G;D1D	8.86	-	27.25	0.50	27.75	0.59566	41	0.02820	1.00000
6.4G;D1D	8.09	-	24.80	0.50	25.30	0.33884	41	0.01604	1.00000
6.7G;D1D	8.09	-	27.13	0.50	27.63	0.57943	41	0.02743	1.00000
7.0G;D1D	7.71	-	25.59	0.50	26.09	0.40644	41	0.01924	1.00000

For Radio 4

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;G1D	5.00	23.00	28.00	0.50	28.50	0.70795	41	0.03351	1.00000
5.2G;D1D	5.80	23.70	29.50	0.50	30.00	1.00000	41	0.04734	1.00000
5.3G;D1D	5.80	21.78	27.58	0.50	28.08	0.64269	41	0.03042	1.00000
5.6G;D1D	5.50	20.47	25.97	0.50	26.47	0.44361	41	0.02100	1.00000
5.8G;D1D	5.60	23.63	29.23	0.50	29.73	0.93972	41	0.04448	1.00000
6.2G;D1D	5.60	20.76	26.36	0.50	26.86	0.48529	41	0.02297	1.00000
6.4G;D1D	5.50	19.06	24.56	0.50	25.06	0.32063	41	0.01518	1.00000
6.7G;D1D	5.50	21.24	26.74	0.50	27.24	0.52966	41	0.02507	1.00000
7.0G;D1D	5.60	19.01	24.61	0.50	25.11	0.32434	41	0.01535	1.00000

For Radio 5

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;BT-LE	4.60	7.08	11.68	0.50	12.18	0.01652	41	0.00078	1.00000



MPE Exemption Option C								
Radio	Frequency (MHz)	$\lambda/2\pi$ (m)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
Radio 1 5GHz	5200	0.0092	0.41	29.83	27.68	0.586	3.228	Complies
Radio 2 2.4GHz	2437	0.0196		29.62	27.47	0.558	3.228	Complies
Radio 3 6G	6185	0.0077		27.75	25.60	0.363	3.228	Complies
Radio 4 2.4GHz	2437	0.0196		28.50	26.35	0.432	3.228	Complies
Radio 4 5GHz	5200	0.0092		30.00	27.85	0.610	3.228	Complies
Radio 4 6G	6945	0.0069		27.24	25.09	0.323	3.228	Complies
Radio 5 Bluetooth	2440	0.0196		12.18	10.03	0.010	3.228	Complies

Simultaneous Transmission Analysis Mode:

Mode 1: Radio 1: 5GHz + Radio 2: 2.4GHz + Radio 3: 6GHz + Radio 4: 2.4GHz + Radio 5: Bluetooth

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
5200	0.41	29.83	27.68	0.586	3.228	0.60	<= 1
2437		29.62	27.47	0.558	3.228		
6185		27.75	25.60	0.363	3.228		
2437		28.50	26.35	0.432	3.228		
2440		12.18	10.03	0.010	3.228		

Mode 2: Radio 1: 5GHz + Radio 2: 2.4GHz + Radio 3: 6GHz + Radio 4: 5GHz + Radio 5: Bluetooth

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
5200	0.41	29.83	27.68	0.586	3.228	0.66	<= 1
2437		29.62	27.47	0.558	3.228		
6185		27.75	25.60	0.363	3.228		
5200		30.00	27.85	0.610	3.228		
2440		12.18	10.03	0.010	3.228		



Mode 3: Radio 1: 5GHz + Radio 2: 2.4GHz + Radio 3: 6GHz + Radio 4: 6GHz + Radio 5: Bluetooth

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
5200	0.41	29.83	27.68	0.586	3.228	0.57	<= 1
2437		29.62	27.47	0.558	3.228		
6185		27.75	25.60	0.363	3.228		
6945		27.24	25.09	0.323	3.228		
2440		12.18	10.03	0.010	3.228		

————THE END————