Radio Exposure Evaluation Report

FCC ID	:	**UDX-600215010**
Equipment	:	**Cisco Wireless 9172H Series Wi-Fi 7 Access Point**
Brand Name	:	**CISCO**
Model Name	:	**CW9172H**
Applicant	:	**Cisco Systems, Inc. 170 West Tasman Drive, San Jose, CA 95134 USA**
Manufacturer	:	**Cisco Systems, Inc. 170 West Tasman Drive, San Jose, CA 95134 USA**
Standard	:	**47 CFR FCC Part 2 Subpart J, section 2.1091**

The product was received on Oct. 30, 2024, and testing was started from Nov. 19, 2024 and completed on Dec. 26, 2024. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR FCC Part 2 Subpart J, section 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. Hsinhua Laboratory, the test report shall not be reproduced except in full.

Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory
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History of this test report

Report No.	Version	Description	Issued Date
FA481514-01AA	01	Initial issue of report	Feb. 25, 2025

Summary of Test Result

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

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
None

Reviewed by: Barry Hsiao

Report Producer: Debby Hung

1 General Description

1.1 Information

1.1.1 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) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
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, 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: DSSS (GFSK)

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Radio
1	Sercomm	61720064WA	PIFA	I-Pex	2.4G	Radio1
					5G	Radio 2
2	Sercomm	61720065WA	PIFA	I-Pex	2.4G	Radio1
					5G	Radio 2
3	Sercomm	61720062WA	PIFA	I-Pex	6G	Radio 2
4	Sercomm	61720063WA	PIFA	I-Pex	6G	Radio 2
5	Sercomm	61720067WA	PIFA	I-Pex	2.4G/5G/6G	Radio 3
6	Sercomm	61720066WA	PIFA	I-Pex	BT	BT

Ant.	Port	Gain (dBi)									
		2.4G	5G				6G				BT
			UNII-1	UNII-2A	UNII-2C	UNII-3	UNII-5	UNII-6	UNII-7	UNII-8	
1	1	2.68	4.35	5.91	5.86	5	-	-	-	-	-
2	2	2.04	3.5	3.74	5.92	4.6	-	-	-	-	-
3	1	-	-	-	-	-	5.04	4.33	4.45	4.49	-
4	2	-	-	-	-	-	2.88	2.88	3.11	2.92	-
5	1	1.05	4.02	4.78	3.61	2.68	3.33	2.51	1.64	1.01	-
6	1	-	-	-	-	-	-	-	-	-	4.57

Composite Gain (dBi)										
Ant.	Wi-Fi Mode	2.4G	5G				6G			
		Radio 1	Radio 2				Radio 2			
			UNII-1	UNII-2A	UNII-2C	UNII-3	UNII-5	UNII-6	UNII-7	UNII-8
1-2	DG [1SS]	2.86	6.34	6.89	7.56	6.98	-	-	-	-
	DG [2SS]	2.68	4.35	5.91	5.92	5	-	-	-	-
3-4	DG [1SS]	-	-	-	-	-	5.27	5.41	6.31	6.38
	DG [2SS]	-	-	-	-	-	5.04	4.33	4.45	4.49

Note 1: The EUT has six antennas.
Note 2: The composite gain is derived as KDB 662911 D03 v01 which was used as directional gain. For more detail information, please refer to the Antenna Pattern Report AP481514-01.

For 2.4GHz function:
For IEEE 802.11 b/g/n/VHT/ax/be mode (1TX/1RX) (Radio 1)
Ant. 1 (port 1) could transmit/receive.
For IEEE 802.11 b/g/n/VHT/ax/be mode (2TX/2RX) (Radio 1)
Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.
For IEEE 802.11 b/g/n/VHT/ax mode (1RX) (Radio 3)
Ant. 5 (port 1) could receive.

For 5GHz function:
For IEEE 802.11 a/n/ac/ax/be mode (1TX/1RX) (Radio 2)
Ant. 1 (port 1) could transmit/receive.
For IEEE 802.11 a/n/ac/ax/be mode (2TX/2RX) (Radio 2)
Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.
For IEEE 802.11 a/n/ac/ax mode (1RX) (Radio 3)
Ant. 5 (port 1) could receive.

For BT function:
For IEEE 802.15.1 Bluetooth mode (1TX/1RX)
Ant. 6 (port 1) could transmit/receive.

For 6GHz function:
For IEEE 802.11 ax/be mode (1TX/1RX) (Radio 2)
Ant. 3 (port 1) could transmit/receive.
For IEEE 802.11 ax/be mode (2TX/2RX) (Radio 2)
Ant. 3 (port 1) and Ant. 4 (port 2) could transmit/receive simultaneously.
For IEEE 802.11 ax mode (1RX) (Radio 3)
Ant. 5 (port 1) could receive.

1.1.3 Accessories

Accessories				
Bracket wall mount	Brand Name	Cisco	Model Name	CW-MNT-H1
RJ45 Cable (main source)	Brand Name	TUNG-LI	Model Name	5U422WC880L0B/D065MM-1
	Category	Cat5e	In/Out door	Indoor
	Signal Line	0.05 meter,non-shielded cable		
RJ45 Cable (2nd source)	Brand Name	NIEN-YI	Model Name	NYS6142
	Category	Cat5e	In/Out door	Indoor
	Signal Line	0.05 meter,non-shielded cable		

Reminder: Regarding to more detail and other information, please refer to user manual.

1.2 Applicable Standards

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

- 47 CFR FCC Part 2 Subpart J, section 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

1.3 Testing Location

Test Lab.：Sporton International Inc. Hsinhua Laboratory			
☒	Hsinhua (TAF: 3785)	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)	
		TEL: 886-3-327-3456	**FAX:** 886-3-327-0973
Test site Designation No. TW3785 with FCC.			
☐	Wen 33rd.St. (TAF: 3785)	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)	
		TEL: 886-3-318-0787	**FAX:** 886-3-318-0287
Test site Designation No. TW0008 with FCC.			

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/ cm²)	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 / f²)*	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/ cm²)	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/f²)*	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

Multiple Transmitters Condition
Co-location as simultaneously transmitting (co-transmitting) and the evaluation shall be consider that simultaneous transmissions from co-located devices the individual transmitters are evaluated separately. After sum of the individual value (basic restriction / reference level) are measured/calculated also have to under basic restriction / reference level.
Co-transmitting mode: Radio 1:WLAN 2.4G + Radio 2: WLAN 5G + Radio 2: WLAN 6G + Bluetooth

2.2 RF Exposure Exempt Measurement

Option	Refer Std.	Exemption Exposure Thresholds (TL)
A	§1.1307(b)(3)(i)(A)	Available maximum time-averaged power is no more than 1 mW
B	§1.1307(b)(3)(i)(B)	$\mathrm{P}th(mW)=\begin{cases} ERP_{20cm}(d/20cm)^{x} \rightarrow d \le 20cm \\ ERP_{20cm} \rightarrow 20cm < d \le 40cm \end{cases}$ $x=-\log_{10}\left(\frac{60}{ERP_{20cm}\sqrt{f}}\right)$ and f is in GHz $\begin{cases} ERP_{20cm}: 0.3GHz \le f < 1.5GHz \rightarrow 2040f(mW) \\ ERP_{20cm}: 1.5GHz \le f \le 6GHz \rightarrow 3060(mW) \end{cases}$
C	§1.1307(b)(3)(i)(C)	$\begin{cases} 0.3 \sim 1.34MHz \rightarrow ERP(\mathrm{W}) = 1920R^2 \\ 1.34 \sim 30MHz \rightarrow ERP(\mathrm{W}) = 3450R^2/f^2 \\ 30 \sim 300MHz \rightarrow ERP(\mathrm{W}) = 3.83R^2 \\ 300 \sim 1500MHz \rightarrow ERP(\mathrm{W}) = 0.0128R^2 f \\ 1500 \sim 100000MHz \rightarrow ERP(\mathrm{W}) = 19.2R^2 \end{cases}$ f is in MHz; R is in m; $\mathrm{R} > \lambda/2\pi$

2.3 Multiple RF Sources Exposure

Refer Std.	Exemption Exposure Thresholds (TL)
§1.1307(b)(3)(ii)(A)	The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required)
§1.1307(b)(3)(ii)(B)	$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{ExposureLimit_k}\le 1$ a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(B) of this section for P , including existing exempt transmitters and those being added. b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added. c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters. P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive). $P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph §1.1307(b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i. ERP_j = the ERP of fixed, mobile, or portable RF source j. $ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph §1.1307 (b)(3)(i)(C) of this section. $Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure. $Evaluated\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.

2.4 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.
The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

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

2.5 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure
Non-Beamforming

2.4GHz WLAN_Radio 1_1T1S

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	2.68	21.54	22.07	0.50	180.717	20.00	B	3060.0	0.0591
2.4G;D1D	2.68	21.19	21.72	0.50	166.725	20.00	B	3060.0	0.0545

2.4GHz WLAN_Radio 1_2T1S

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	2.68	24.76	25.29	0.50	379.315	20.00	B	3060.0	0.1240
2.4G;D1D	2.68	24.43	24.96	0.50	351.560	20.00	B	3060.0	0.1149

5GHz WLAN_Radio 2_1T1S

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
5.2G;D1D	4.35	22.31	24.51	0.50	316.957	20.00	B	3060.0	0.1036
5.3G;D1D	5.91	22.26	26.02	0.50	448.745	20.00	B	3060.0	0.1467
5.6G;D1D	5.86	21.78	25.49	0.50	397.192	20.00	B	3060.0	0.1298
5.8G;D1D	5.00	21.42	24.27	0.50	299.916	20.00	B	3060.0	0.0980

5GHz WLAN_Radio 2_2T1S

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
5.2G;D1D	4.35	25.33	27.53	0.50	635.331	20.00	B	3060.0	0.2077
5.3G;D1D	5.91	23.70	27.46	0.50	625.173	20.00	B	3060.0	0.2044
5.6G;D1D	5.92	23.57	27.34	0.50	608.135	20.00	B	3060.0	0.1988
5.8G;D1D	5.00	24.09	26.94	0.50	554.626	20.00	B	3060.0	0.1813

6GHz WLAN_Radio 2_1T1S

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
6.2G;D1D	-	-	21.66	0.50	164.437	20.00	C	768.007	0.2142
6.4G;D1D	-	-	21.91	0.50	174.181	20.00	C	768.007	0.2269
6.7G;D1D	-	-	22.81	0.50	214.289	20.00	C	768.007	0.2791
7.0G;D1D	-	-	22.31	0.50	190.985	20.00	C	768.007	0.2488

6GHz WLAN_Radio 2_2T1S

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
6.2G;D1D	-	-	23.94	0.50	277.971	20.00	C	768.007	0.3621
6.4G;D1D	-	-	23.97	0.50	279.898	20.00	C	768.007	0.3646
6.7G;D1D	-	-	24.02	0.50	283.139	20.00	C	768.007	0.3688
7.0G;D1D	-	-	23.55	0.50	254.097	20.00	C	768.007	0.3310

Bluetooth

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;BT-LE	4.57	19.70	22.12	0.50	182.810	20.00	B	3060.0	0.0598

Beamforming
2.4GHz WLAN_Radio 1

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	2.86	24.20	24.91	0.50	347.536	20.00	B	3060.0	0.1136

5GHz WLAN_Radio 2

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
5.2G;D1D	6.34	25.33	29.52	0.50	1004.616	20.00	B	3060.0	0.3284
5.3G;D1D	6.89	22.57	27.31	0.50	603.949	20.00	B	3060.0	0.1974
5.6G;D1D	7.56	21.93	27.34	0.50	608.135	20.00	B	3060.0	0.1988
5.8G;D1D	6.98	24.09	28.92	0.50	874.984	20.00	B	3060.0	0.2860

6GHz WLAN_Radio 2

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
6.2G;D1D	-	-	25.16	0.50	368.129	20.00	C	768.007	0.4795
6.4G;D1D	-	-	23.08	0.50	228.034	20.00	C	768.007	0.2970
6.7G;D1D	-	-	25.20	0.50	371.535	20.00	C	768.007	0.4839
7.0G;D1D	-	-	24.55	0.50	319.890	20.00	C	768.007	0.4167

Simultaneous Transmission Analysis Mode:

Radio 1:WLAN 2.4G + Radio 2: WLAN 5G + Radio 2: WLAN 6G + Bluetooth

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	2.68	24.76	25.29	0.50	379.315	20.00	B	3060.0	0.1240
5.2G;D1D	6.34	25.33	29.52	0.50	1004.616	20.00	B	3060.0	0.3284
6.7G;D1D	-	-	25.20	0.50	371.535	20.00	C	768.007	0.4839
2.4G;BT-LE	4.57	19.70	22.12	0.50	182.810	20.00	B	3060.0	0.0598
Sum TL Ratio_B	0.5122								
Sum TL Ratio_C	0.4839								
Sum Ratio	0.9961								
Ratio Limit	1								

Note 1: Option A, B and C refer as clause 2.2
Note 2: For option B, Pth(mW) convert to TL ERP(mW); For option C, ERP(W) convert to TL ERP(mW)
Note 3: TL Ratio=Tune-up ERP(mW)/TL ERP(mW)
Note 4: Refer as clause 2.3 Multiple RF Sources Exposure. Please follow below option and sum TL ration table.

Option	Sum TL Ratio_B	Option	Sum TL Ratio_C	Option	Sum TL Ratio_E
B	$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}}$	C	$\sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}}$	E	$\sum_{k=1}^{c} \frac{Evaluated_k}{ExposureLimit_k}$

Note: The above antenna gain was declared by manufacturer.

———THE END———