Testing Laboratory 3787

RADIO EXPOSURE TEST REPORT

FCC ID	:	UDX-600104010
Equipment	:	Wi-Fi 6E Access Point
Brand Name	:	Cisco
Model Name	:	MR57-HW
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 Part 2.1091

The product was received on Oct. 06, 2021, and testing was started from Oct. 16, 2021 and completed on Jan. 20, 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: Cliff Chang

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
FA181947-01	01	Initial issue of report	Feb. 07, 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:
1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer. 2. 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: Jessie Wei

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 5725-5850 5725-5895	5180-5240 5745-5825 5835-5885	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)
6GHz	5925-7125	5955-7115	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK

1.2 Antenna Information

Ant.	Port					Brand	P/N	Ant. Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz UNII 1~3	WLAN 5GHz UNII 2C~4	WLAN 6GHz UNII 5~8	Bluetooth					
1	4	4	-	-	-	CISCO	95XKAN15.G42	PIFA	I-PEX	Note1
2	3	3	-	-	-	CISCO	95XKAN15.G43	PIFA	I-PEX	
3	2	2	-	-	-	CISCO	95XKAN15.G44	PIFA	I-PEX	
4	1	1	-	-	-	CISCO	95XKAN15.G45	PIFA	I-PEX	
5	-	-	2	2	-	CISCO	95XKAN15.G46	Dipole	I-PEX	
6	-	-	1	1	-	CISCO	95XKAN15.G47	Dipole	I-PEX	
7	-	-	4	4	-	CISCO	95XKAN15.G48	Dipole	I-PEX	
8	-	-	3	3	-	CISCO	95XKAN15.G49	Dipole	I-PEX	
9	1	1	-	-	-	CISCO	95XKAN15.G51	PIFA	I-PEX	
10	-	-	-	-	1	CISCO	95XKAN15.G50	PIFA	I-PEX	

Note1:

Ant.	Antenna Gain (dBi)											
	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3	WLAN 5GHz UNII 4	WLAN 6GHz UNII 5	WLAN 6GHz UNII 6	WLAN 6GHz UNII 7	WLAN 6GHz UNII 8	Blue tooth	Remark
1	1.87	4.07	4.09	2.45	1.97	-	-	-	-	-	-	Radio 1
2	2.68	3.7	4.21	3	3.84	-	-	-	-	-	-	Radio 1
3	2.7	3.29	3.51	2.33	3.03	-	-	-	-	-	-	Radio 1
4	1.52	1.8	1.7	1.44	1.61	-	-	-	-	-	-	Radio 1
5	-	-	-	3.52	3.3	4.84	5.05	4.08	4.27	3.47	-	Radio 2
6	-	-	-	3.54	4.33	4.28	4.71	3.72	3.49	4.02	-	Radio 2
7	-	-	-	4.28	4.45	4.6	4.64	4.40	4.31	3.39	-	Radio 2
8	-	-	-	4.13	4.39	4.75	4.76	3.51	4.21	4.03	-	Radio 2
9	3.80	6.29	6.29	6.29	6.29	-	-	-	-	-	-	Radio 3
10	-	-	-	-	-	-	-	-	-	-	3.65	Radio 4

Note2:

Item	Directional Gain (dBi)						Remark
	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3	WLAN 5GHz UNII 4	
2T1S	3.93	4.36	4.68	3.36	3.75	-	Radio 1
4T1S	5.7	6.45	6.36	5.06	5.18	-	
2T1S	-	-	-	5.32	6.01	5.57	Radio 2
4T1S	-	-	-	5.65	6.75	6.43	

Note3: Radio 1 (WLAN 2.4/5GHz UNII 1~3), Radio 2 (5GHz UNII 2C, 3, 4): The directional gain is measured which follows the procedure of KDB 662911 D03. The antenna report is provided in the operational description for this application.
This EUT doesn't enable UNII 2A, 2C.

Note4: The above information was declared by manufacturer.
The EUT has ten antennas.
For WLAN 2.4GHz function (Radio 1):
For IEEE 802.11b/g/n/VHT/ax mode (1TX, 2TX, 4TX/4RX):
For 1TX
Only Port 1 can be use as transmitting antenna.
For 2TX
Only Port 1 and Port 2 can be use as transmitting antenna.
Port 1 and Port 2 could transmit simultaneously.
For 4TX
Port 1, Port 2, Port 3 and Port 4 can be use as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.
For 4RX
Port 1, Port 2, Port 3 and Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3 and Port 4 could receive simultaneously.
For WLAN 5GHz function (Radio 1 and Radio 2):
For IEEE 802.11a/n/ac/ax mode (1TX, 2TX, 4TX/4RX):
For 1TX
Only Port 1 can be use as transmitting antenna.
For 2TX
Only Port 1 and Port 2 can be use as transmitting antenna.
Port 1 and Port 2 could transmit simultaneously.
For 4TX
Port 1, Port 2, Port 3 and Port 4 can be use as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.
For 4RX
Port 1, Port 2, Port 3 and Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3 and Port 4 could receive simultaneously.
For 6GHz function (Radio 2):
For IEEE 802.11ax mode (1TX, 2TX, 4TX/4RX):
For 1TX
Only Port 1 can be use as transmitting antenna.
For 2TX
Only Port 1 and Port 2 can be use as transmitting antenna.
Port 1 and Port 2 could transmit simultaneously.
For 4TX
Port 1, Port 2, Port 3 and Port 4 can be use as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.
For 4RX
Port 1, Port 2, Port 3 and Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3 and Port 4 could receive simultaneously.
For Scanning Radio 3:
For WLAN 2.4GHz function
For 802.11b/g/n/VHT/ax mode (1RX):
Only Port 1 can be used as receiving functions.
For WLAN 5GHz function
For IEEE 802.11a/n/ac/ax mode (1RX):
Only Port 1 can be used as receiving functions.
For Bluetooth function (Radio 4):
For Bluetooth mode (1TX/1RX):
Only Port 1 can be used as transmitting/receiving antenna.

1.3 Table for Radio function

Function / Radio	WLAN 2.4GHz	WLAN 5GHz UNII 1, 3	WLAN 5GHz UNII 3~4	WLAN 6GHz UNII 5~8	Bluetooth
1 (Iron Radio)	V	V	-	-	-
2 (Pine Radio)	-	-	V	V	-
3 (Scanning Radio)	V	V	-	-	-
4	-	-	-	-	V

Note: The above information was declared by manufacturer.

1.4 Table for EUT Operation Function

Mode	Operation Function
1	R1: 2.4GHz/5GHz Low Band+R2: 5GHz High band+R3: 2.4GHz+R4: Bluetooth
2	R1: 2.4GHz/5GHz Low Band+R2: 5GHz High band+R3: 5GHz+R4: Bluetooth
3	R1: 2.4GHz/5GHz Full Band+R2: 6E+R3: 2.4GHz+R4: Bluetooth
4	R1: 2.4GHz/5GHz Full Band+R2: 6E+R3: 5GHz+R4: Bluetooth

Note: The above information was declared by manufacturer.

1.5 Accessories

Wall-mounted rack*1

1.6 Testing Location

Testing Location Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) 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/ 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/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/ 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/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 27 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 = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

<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)
2.4G;D1D	5.70	25.78	31.48	0.50	31.98	1.57761	27	0.17221	1.00000
5.2G;D1D	6.45	27.89	34.34	0.50	34.84	3.04789	27	0.33270	1.00000
5.8G;D1D	5.18	27.54	32.72	0.50	33.22	2.09894	27	0.22911	1.00000

<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)
5.8G;D1D	6.75	28.74	35.49	0.50	35.99	3.97192	27	0.43356	1.00000
5.81G;D1D	6.43	28.46	34.89	0.50	35.39	3.45939	27	0.37762	1.00000
6.2G;D1D	10.81	-	26.46	0.50	26.96	0.49659	27	0.05421	1.00000
6.4G;D1D	3.72	-	25.73	0.50	26.23	0.41976	27	0.04582	1.00000
6.7G;D1D	10.10	-	26.20	0.50	26.70	0.46774	27	0.05106	1.00000
7.0G;D1D	9.75	-	24.63	0.50	25.13	0.32584	27	0.03557	1.00000

<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;BT-LE	3.65	19.00	22.65	0.50	23.15	0.20654	27	0.02255	1.00000

Simultaneous Transmission Analysis Mode:

Mode 1: R1: 2.4GHz/5GHz Low Band+R2: 5GHz High band+R4: Bluetooth

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)	Ratio (S/Limit)
2.4G;D1D	5.70	25.78	31.48	0.50	31.98	1.57761	27	0.17221	1.00000	0.17221
5.2G;D1D	6.45	27.89	34.34	0.50	34.84	3.04789	27	0.33270	1.00000	0.33270
5.8G;D1D	6.75	28.74	35.49	0.50	35.99	3.97192	27	0.43356	1.00000	0.43356
2.4G;BT-LE	3.65	19.00	22.65	0.50	23.15	0.20654	27	0.02255	1.00000	0.02255
									Sum Ratio	0.96102
									Ratio Limit	1

Mode 2: R1: 2.4GHz/5GHz Full Band+R2: 6E+R4: Bluetooth

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)	Ratio (S/Limit)
2.4G;D1D	5.70	25.78	31.48	0.50	31.98	1.57761	27	0.17221	1.00000	0.17221
5.2G;D1D	6.45	27.89	34.34	0.50	34.84	3.04789	27	0.33270	1.00000	0.33270
6.2G;D1D	10.81	-	26.46	0.50	26.96	0.49659	27	0.05421	1.00000	0.05421
2.4G;BT-LE	3.65	19.00	22.65	0.50	23.15	0.20654	27	0.02255	1.00000	0.02255
									Sum Ratio	0.58167
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————