



RADIO EXPOSURE TEST REPORT

FCC ID : UDX-600149010
Equipment : Wi-Fi 6 Access Point
Brand Name : Cisco
Model Name : MR78-HW,GR62-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 Mar. 22, 2022, and testing was started from Apr. 02, 2022 and completed on May 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 variant 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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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 11
Issued Date : Jul. 27, 2022
Report Version : 01



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: Penny Kao



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



1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth					
1	1	1	-	CISCO	95XEAK15.007	Dipole	I-PEX	Note1
2	2	2	-	CISCO	95XEAK15.006	Dipole	I-PEX	
3	-	-	1	CISCO	95XEAK15.008	Dipole	I-PEX	

Note1:

<Antenna Gain>

Ant.	Port			Gain (dBi)					
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth	WLAN 2.4GHz	WLAN 5GHz				Bluetooth
					UNII 1	UNII 2A	UNII 2C	UNII 3	
1	1	1	-	3.27	2.14	2.10	3.66	4.47	-
2	2	2	-	3.25	3.00	2.39	2.52	3.32	-
3	-	-	1	-	-	-	-	-	2.4

< Directional Gain>

Directional Gain (dBi)					
Item	WLAN 2.4GHz	WLAN 5GHz			
		UNII 1	UNII 2A	UNII 2C	UNII 3
2T1S	4.28	3.72	3.57	4.26	4.95
2T2S	3.27	3.00	2.39	3.66	4.47

Note2: The above information was declared by manufacturer.

Note3: WLAN 2.4GHz and WLAN 5GHz directional gain is measured which follows the procedure of KDB 662911 D03. The antenna report is provided in the operational description for this application.

Note4: The EUT has three antennas.

<WLAN 2.4GHz function>

For IEEE 802.11b/g/n/VHT/ax (1TX, 2TX/2RX):

For 1TX

Only Port 1 can be use as transmitting antenna.

For 2TX/2RX

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

Pot 1, Port 2 could transmit/receive simultaneously.

<WLAN 5GHz function>

For IEEE 802.11a/n/ac/ax mode (1TX, 2TX/2RX)

For 1TX

Only Port 1 can be use as transmitting antenna.

For 2TX/2RX

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

Pot 1, Port 2 could transmit/receive simultaneously.

<For Bluetooth function>

Bluetooth mode (1TX/1RX)

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

1.2.1 Table for Multiple Listing

Model Name	Description
MR78-HW	All the models are identical, the difference model for difference brand served as marketing strategy.
GR62-HW	

Note 1: From the above models, model: MR78-HW was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.2.2 Table for EUT Information

EUT	Item	Source	Brand Name	Model Name
1	LAN Chip	Main	Qualcomm	QCA8081
2		Second	Qualcomm	QCA8080

Note 1: After evaluating, EUT 1 was selected to perform for all tests.

Note 2: The above information was declared by manufacturer

1.2.3 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA232209

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding UNII 2A and UNII 2C (5250~5350 MHz, 5470~5725 MHz) for this device.	Maximum Permissible Exposure.

Note: Maximum Permissible Exposure of 2.4GHz, 5GHz UNII 1, 3 and Bluetooth are based on original



1.3 Accessories

Accessories				
No.	Equipment Name	Brand Name	Model Name	Rating
1	Adapter 1	Meraki	GA-PWR-12W-US	INPUT: 100-240V~ 50/60Hz, 0.4A MAX. OUTPUT: +12.0V, 1.0A, 12.0W MAX.
2	Adapter 2	UMEC	MA-PWR-30WAC	INPUT: 100-240V~0.8A, 50-60Hz OUTPUT: 12.0V, 2.5A, 30.0W
Others				
Wall Bracket*1 RJ-45 cable*1: Non-shielded, 1.8m Grounding wire*1: Non-shielded, 1m				

1.4 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

1.5 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 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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, <= P_{th}.

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

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)	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	3.27	27.37	30.64	0.50	31.14	1.30017	20	0.25866	1.00000
5.2G;D1D	3.72	24.81	28.53	0.50	29.03	0.79983	20	0.15912	1.00000
5.3G;D1D	3.57	23.78	27.35	0.50	27.85	0.60954	20	0.12126	1.00000
5.6G;D1D	4.26	23.91	28.17	0.50	28.67	0.73621	20	0.14646	1.00000
5.8G;D1D	4.95	27.78	32.73	0.50	33.23	2.10378	20	0.41852	1.00000
2.4G;BT-LE	2.40	18.53	20.93	0.50	21.43	0.13900	20	0.02765	1.00000

MPE Exemption Option B						
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
2437	0.2	31.14	28.99	0.793	3.060	Complies
5745		33.23	31.08	1.282	3.060	Complies
2440		21.43	19.28	0.085	3.060	Complies

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz + Bluetooth

Simultaneous Transmissions Option B							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2437	0.2	31.14	28.99	0.793	3.060	0.71	<= 1
5745		33.23	31.08	1.282	3.060		
2440		21.43	19.28	0.085	3.060		

————THE END————