RF EXPOSURE EVALUATION REPORT

FCC ID	:	**UDX-60076025**
Equipment	:	**Wi-Fi Router**
Brand Name	:	**CISCO**
Model Name	:	**MX68W-HW**
Applicant	:	**Cisco Systems, Inc.** **170 West Tasman Drive, San Jose, CA 95134**
Standard	:	**47 CFR Part 2.1091**

We, SPORTON INTERNATIONAL INC has been evaluated in accordance with 47 CFR Part 2.1091 for the device and pass the limit.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Jones Tsai

Approved by: Jones Tsai / Manager

SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory

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History of this test report

Report No.	Version	Description	Issued Date
FA832026	Rev. 01	Initial issue of report	Jul. 23, 2018

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Wi-Fi Router
Brand Name	CISCO
Model Name	MX68W-HW
FCC ID	UDX-60076025
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz
Mode	802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80
HW Version	0.20
SW Version	T-201807131655-Geff7ac40
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Reviewed by: Eric Huang

Report Producer: Wan Liu

2. Maximum RF average output power among production units

<Non-Beamforming Mode>

Mode		Maximum Average Power (dBm)
2.4GHz WLAN	802.11b	28
	802.11g	26
	802.11n-HT20	25
	802.11n-HT40	23
	802.11ac-VHT20	25
	802.11ac-VHT40	23
5GHz WLAN	802.11a	29
	802.11n-HT20	29
	802.11n-HT40	29
	802.11ac-VHT20	29
	802.11ac-VHT40	29
	802.11ac-VHT80	24

<Beamforming Mode>

Mode		Maximum Average Power (dBm)
2.4GHz WLAN	802.11b	
	802.11g	
	802.11n-HT20	26
	802.11n-HT40	25
	802.11ac-VHT20	23
	802.11ac-VHT40	25
5GHz WLAN	802.11a	
	802.11n-HT20	29
	802.11n-HT40	29
	802.11ac-VHT20	29
	802.11ac-VHT40	29
	802.11ac-VHT80	29

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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				
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

The MPE was calculated at 22 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

<Non-Beamforming Mode>

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 22cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
2.4GHz WLAN	2412.0	2.00	28.00	30.000	1.000	1000.000	0.164	1.000	0.164
5GHz WLAN	5180.0	3.10	29.00	32.100	1.622	1621.810	0.267	1.000	0.267

<Beamforming Mode>

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 22cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
2.4GHz WLAN	2412.0	5.01	26.00	31.010	1.262	1261.828	0.208	1.000	0.208
5GHz WLAN	5180.0	6.01	29.00	35.010	3.170	3169.567	0.521	1.000	0.521

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band
2. For this device supports Beamforming for WLAN 2.4GHz HT20/HT40/VHT20/VHT40 and WLAN 5.2GHz/5.8GHz HT20/HT40/VHT20/VHT40/VHT80; therefore, in the table above which consider maximum directional Gain 5.01dBi / 6.01dBI for WLAN2.4GHz / WLAN5GHz Beamforming mode.

4.2. Collocated Power Density Calculation

Maximum 2.4GHz WLAN Power Density / Limit	Maximum 5GHz WLAN Power Density / Limit	Σ(Power Density / Limit) of 2.4GHz WLAN + 5GHz WLAN
0.208	0.521	0.729

Note:

1. ∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for 2.4GHz WLAN + 5GHz WLAN.
2. Considering the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.