



RF Exposure Evaluation Report

APPLICANT : Shanghai MXCHIP Information Technology Co., Ltd.
EQUIPMENT : Embedded WIFI module
BRAND NAME : MXCHIP
MODEL NAME : EMW3090-P, EMW3090-E
FCC ID : P53-EMW3090
STANDARD : 47 CFR Part 2.1091

We, Sporton International (Kunshan) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Approved by: Mark Qu / Manager

Sporton International (Kunshan) Inc.

No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China



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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA791305	Rev. 01	Initial issue of report	Oct. 31, 2017

**1. Administration Data****1.1. Testing Laboratory**

Testing Laboratory	
Test Site	Sporton International (Kunshan) Inc.
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958

Applicant	
Company Name	Shanghai MXCHIP Information Technology Co., Ltd.
Address	9thFloor, No.5 Lane2145JinshaJiangRoad,Putuo District, ShangHai (200333)

Manufacturer	
Company Name	Shanghai MXCHIP Information Technology Co., Ltd.
Address	9thFloor, No.5 Lane2145JinshaJiangRoad,Putuo District, ShangHai (200333)

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Embedded WIFI module
Brand Name	MXCHIP
Model Name	EMW3090-P, EMW3090-E
FCC ID	P53-EMW3090
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz
Mode	WLAN 2.4GHz 802.11b/g/n HT20/HT40
Antenna Type/Gain	Sample1 : Internal PCB Antenna Antenna gain: 2dBi Sample 2: External PIFA Antenna Model name: IPEX1.3-2.4G-L131 Antenna gain: 2dBi
HW Version	V2.0
SW Version	0000.0000.AT14
EUT Stage	Production Unit
Remark: - The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description. - This device has two antenna types of WLAN transmitter, external antenna and internal antenna, but they can't transmit simultaneously. - There are two types of EUT, the differences between two samples are only for the WLAN antenna type. The sample 1 (Model name: EMW3090-P) is internal (PCB) antenna, and the sample 2 (Model name: EMW3090-E) is external (PIFA) antenna. Internal and external antenna can't transmit simultaneously.	

**3. Maximum RF average output power among production units**

Frequency	Mode	Maximum Average Power (dBm)
WLAN 2.4GHz	802.11b	18.00
	802.11g	16.00
	802.11n-HT20	15.00
	802.11n-HT40	15.00



4. 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/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				
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

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:

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

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

**5. Radio Frequency Radiation Exposure Evaluation****5.1. Standalone Power Density Calculation****< Internal PCB Antenna >**

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
WLAN2.4GHz 802.11b	2412	2.00	18.00	20.000	0.100	100.000	0.020	1.000
WLAN2.4GHz 802.11g	2412	2.00	16.00	18.000	0.063	63.096	0.013	1.000
WLAN2.4GHz 802.11n-HT20	2412	2.00	15.00	17.000	0.050	50.119	0.010	1.000
WLAN2.4GHz 802.11n-HT40	2422	2.00	15.00	17.000	0.050	50.119	0.010	1.000

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

< External PIFA Antenna >

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
WLAN2.4GHz 802.11b	2412	2.00	18.00	20.000	0.100	100.000	0.020	1.000
WLAN2.4GHz 802.11g	2412	2.00	16.00	18.000	0.063	63.096	0.013	1.000
WLAN2.4GHz 802.11n-HT20	2412	2.00	15.00	17.000	0.050	50.119	0.010	1.000
WLAN2.4GHz 802.11n-HT40	2422	2.00	15.00	17.000	0.050	50.119	0.010	1.000

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

Conclusion:

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