



## RF Exposure Evaluation Declaration

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**FCC ID:** TKZAWM688

**Applicant:** AsiaRF Co., Ltd.

**Application Type:** Certification

**Product:** WiFi AP Router Module

**Model No.:** AWM688

**FCC Classification:** Digital Transmission System (DTS)

**Test Procedure(s):** KDB 447498 D01 General RF Exposure Guidance v06

Reviewed By:

( Sunny Sun )

Approved By:

(Robin Wu)



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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### Revision History

Report No.	Version	Description	Issue Date	Note
2006RSU029-U2	Rev. 01	Initial Report	07-28-2020	Valid

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## CONTENTS

Description	Page
<b>General Information.....</b>	<b>4</b>
<b>1. PRODUCT INFORMATION.....</b>	<b>5</b>
1.1. Equipment Description.....	5
1.2. Working Frequencies for this report .....	5
1.3. Antenna Description .....	6
1.4. Description of Antenna RF Port .....	6
1.5. Description of Test Software .....	6
<b>2. RF Exposure Evaluation.....</b>	<b>7</b>
2.1. Limits .....	7
2.2. Test Result of RF Exposure Evaluation .....	8
<b>Appendix - EUT Photograph .....</b>	<b>9</b>

## General Information

<b>Applicant:</b>	AsiaRF Co., Ltd.
<b>Applicant Address:</b>	3F, 215, Dehe Road, Yonghe Dist. New Taipei City 234, Taiwan
<b>Manufacturer:</b>	AsiaRF Co., Ltd.
<b>Manufacturer Address:</b>	3F, 215, Dehe Road, Yonghe Dist. New Taipei City 234, Taiwan
<b>Test Site:</b>	MRT Technology (Suzhou) Co., Ltd
<b>Test Site Address:</b>	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

## Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Designation No. CN1166) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.



## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

Product Name:	WiFi AP Router Module
Model No.:	AWM688
Wi-Fi Specification:	802.11b/g/n
Frequency Range:	802.11b/g/n-HT20: 2412 ~ 2462MHz 802.11n-HT40: 2422 ~ 2452MHz
Channel Number:	802.11b/g/n-HT20: 11 802.11n-HT40: 7
Type of Modulation:	802.11b: DSSS 802.11g/n: OFDM
Data Rate:	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 150Mbps

### 1.2. Working Frequencies for this report

#### 802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	--	--

#### 802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	--	--	--	--

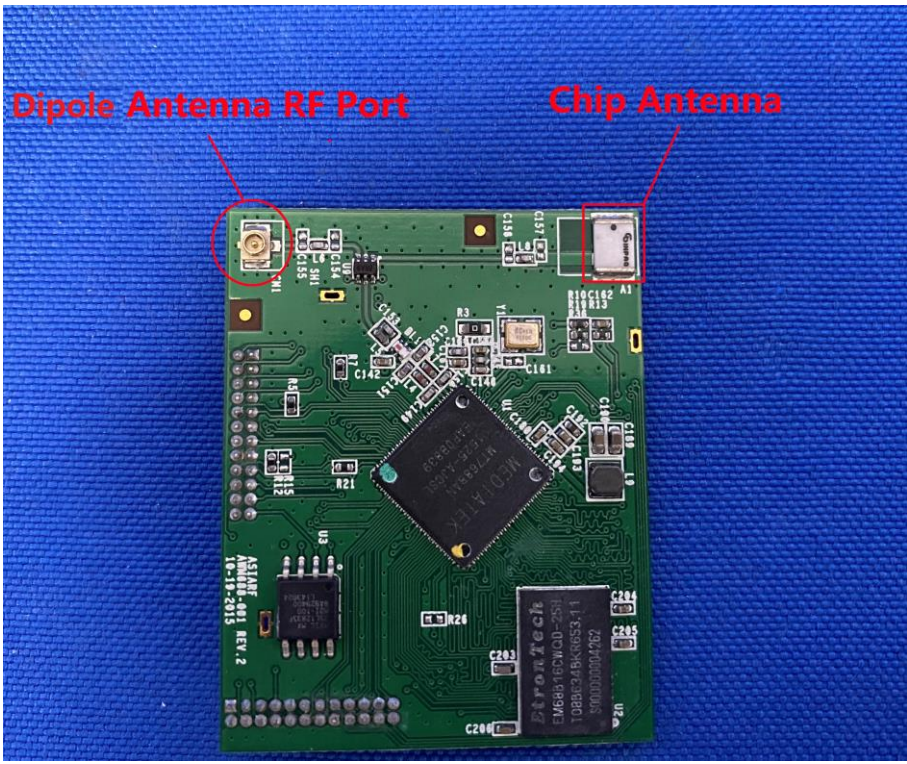
### 1.3. Antenna Description

Antenna Type	Model No.	Manufacturer	Frequency Band (MHz)	Max Antenna Gain (dBi)
Dipole Antenna (Ant 1)	A-2409	AsiaRF Co., Ltd.	2412 ~ 2462	5.0
Chip Antenna (Ant 2)	ACA-5036-A2-CC-S	INPAQ	2412 ~ 2462	3.0

Note: This device only supports SISO mode, and two antennas of this device cannot transmit simultaneously.

### 1.4. Description of Antenna RF Port

Software Control Port	2.4GHz RF Port	
	Dipole Antenna (Ant 1)	Chip Antenna (Ant 2)



### 1.5. Description of Test Software

The test utility software used during testing was “MT7628 QA 0.0.0.96”, and the version was “0.0.0.96”. The power parameter values of this device refer to “Operation Description” file..

## 2. RF Exposure Evaluation

### 2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1500	30
1,500-100,000	--	--	1.0	30

f= Frequency in MHz

\* = Plane-wave equivalent power density

Calculation Formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

## 2.2. Test Result of RF Exposure Evaluation

Product	WiFi AP Router Module
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.3 of antenna description.

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)		Power Density at R = 20 cm (mW/cm <sup>2</sup> )		Limit (mW/cm <sup>2</sup> )
		Ant 1	Ant 2	Ant 1	Ant 2	
802.11b/g/n	2412 ~ 2462MHz	12.82	11.66	0.0120	0.0058	1

### CONCLUSION:

The Max Power Density at R (20 cm) = 0.0120mW/cm<sup>2</sup> < 1mW/cm<sup>2</sup>.

So the EUT complies with the requirement.

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## **Appendix - EUT Photograph**

Refer to “2006RSU029-UE” file.