



RF Exposure Evaluation Declaration

FCC ID: TKZAWV03S

APPLICANT: AsiaRF Ltd.

Application Type: Certification

Product: Wireless VOIP Router

Model No.: AWW03S

Trademark: AsiaRF

FCC Classification: Digital Transmission System (DTS)

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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.

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Revision History

Report No.	Version	Description	Issue Date	Note
1602RSU00902	Rev. 01	Initial report	09-12-2016	Invalid
1602RSU00902	Rev. 02	Change Applicant Name	09-22-2016	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Wireless VOIP Router
Model No.	AWV03S
Frequency Range	2.4GHz: For 802.11b/g/n-HT20: 2412 ~ 2462 MHz For 802.11n-HT40: 2422 ~ 2452 MHz
Maximum Peak Conducted Output Power	802.11b: 21.27dBm 802.11g: 23.37dBm 802.11n-HT20: 25.75dBm 802.11n-HT40: 24.56dBm
Type of Modulation	For 802.11b: CCK For 802.11g/n: OFDM
Antenna Gain	2.0 dBi

1.2. Antenna Description

Antenna Type	Frequency Band (MHz)	Tx Paths	Per Chain Max Antenna Gain (dBi)		CDD Directional Gain (dBi)
			Ant 0	Ant 1	
Dipole Antenna	2412 ~2462	2	2.00	2.00	2.00

The EUT supports Spatial Multiplexing MIMO (SM-MIMO) at 802.11n mode, and that CDD technology is completely uncorrelated.

Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:

- all transmit signals are completely uncorrelated with each other:

$$\text{Directional gain} = G_{ANT}$$

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 ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm²

Pout = 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

Pd is the limit of MPE, 1mW/cm². 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	Wireless VOIP Router
Test Item	RF Exposure Evaluation

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.0dBi for 2.4GHz.

For 2.4GHz ISM Band:

Test Mode	Frequency Band (MHz)	Maximum Peak Output Power (dBm)	Safety Distance R (cm)	Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)
802.11b/g/n-HT20/ n-HT40	2412 ~ 2462	25.75	20	0.1186	1

CONCLUSION:

The Power Density (mW/cm²) = 0.1186 mW/cm² < 1 mW/cm², so the EUT complies with the requirement.