

RF Exposure Evaluation declaration

Product Name	802.11A/B/G/N/AC 1T1R WLAN USB Dongle
Model No.	WN4509L
FCC ID	MSQ-WN4509L

Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt	Jul. 04, 2014
Date of Declaration	Aug. 19, 2014
Report No.	1470161R-RFUSP06V00

The test results relate only to the samples tested.

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

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1. RF Exposure Evaluation

1.1. 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

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/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.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product : 802.11A/B/G/N/AC 1T1R WLAN USB Dongle
 Test Item : RF Exposure Evaluation
 Test Site : No.3 OATS

Operation Frequency	2412-2462MHz, 2422-2452MHz 5180-5240MHz, 5260-5320MHz, 5500-5700MHz, 5745-5825MHz 5190-5230MHz, 5270-5310MHz, 5510-5670MHz, 5755-5795MHz 5720MHz, 5710MHz 5210-5290MHz, 5530-5690MHz
Maximum Conducted output power	24.42dBm
Antenna gain	5.55dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
276.6942	0.026126

Power density in column 4 is much lower than the limit (1 mW/cm²).