

# RF Exposure Evaluation declaration

Product Name : Motherboard  
Model No. : P5AD2-E Deluxe  
FCC ID MSQMWOM6L

Applicant : ASUSTeK COMPUTER INC.  
Address : 4FL., No. 150, Li-Te Rd., Peitou, Taipei,  
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Date of Receipt : Oct. 15, 2004  
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Report No. : 04AL081FI

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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 <sup>2</sup> )	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/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, 1 mW/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.

### 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 : Motherboard  
 Test Item : RF Exposure Evaluation  
 Test Site : No.3 OATS

#### Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.94dBi in linear scale.

#### 802.11b

##### Output Power Into Antenna & RF Exposure Evaluation Distance (Golden: 2.94dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	32.3594	0.0127
6	2437.00	33.8844	0.0133
11	2462.00	22.1309	0.0087

#### 802.11g

##### Output Power Into Antenna & RF Exposure Evaluation Distance (Golden: 2.94dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	14.0929	0.0055
6	2437.00	10.7152	0.0042
11	2462.00	17.0216	0.0067

The distance  $r$  (4<sup>th</sup> column) calculated from the Friis transmission formula is far shorter than 20 cm separation requirement.

### Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.45dBi in linear scale.

### 802.11b

#### Output Power Into Antenna & RF Exposure Evaluation Distance (INPAQ: 2.45dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	32.3594	0.0113
6	2437.00	33.8844	0.0119
11	2462.00	22.1309	0.0077

### 802.11g

#### Output Power Into Antenna & RF Exposure Evaluation Distance (INPAQ: 2.45dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	14.0929	0.0049
6	2437.00	10.7152	0.0037
11	2462.00	17.0216	0.0060

The distance r (4<sup>th</sup> column) calculated from the Friis transmission formula is far shorter than 20 cm separation requirement.