

RF Exposure Evaluation declaration

Product Name	MOXA IEEE802.11 a/b/g mini PCI module
Model No.	WAPA004
FCC ID	SLE-WAPA004

Applicant	MOXA Inc.
Address	4TH FL 135 LANE 235 PAO CHIAO RD SHING TIEN DISTRICT NEW TAIPEI CITY

Date of Receipt	Apr. 12, 2012
Date of Declaration	Jan. 03, 2013
Report No.	12B363R-RFUSP42V01

The declaration results relate only to the samples calculated.

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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/cm^2

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/cm^2 . 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 : MOXA IEEE802.11 a/b/g mini PCI module
 Test Item : RF Exposure Evaluation
 Test Site : No.3 OATS

(802.11b) Output Power Into Antenna & RF Exposure Evaluation Distance (4.62dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	2412.00	65.7658	0.037908
06	2437.00	60.2560	0.034732
11	2462.00	62.8058	0.036202

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

(802.11g) Output Power Into Antenna & RF Exposure Evaluation Distance (4.62dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	2412.00	201.8366	0.116340
06	2437.00	190.5461	0.109832
11	2462.00	193.6422	0.111617

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

(802.11a) Output Power Into Antenna & RF Exposure Evaluation Distance (2.34dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
149	5745	87.7001	0.029904
157	5785	74.9894	0.025570
165	5825	66.6807	0.022737

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

(802.11a) Output Power Into Antenna & RF Exposure Evaluation Distance (2.34dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
36	5180.00	13.6458	0.004653
44	5220.00	13.5519	0.004621
48	5240.00	13.2130	0.004505
52	5260.00	12.3595	0.004214
60	5300.00	11.5878	0.003951
64	5320.00	11.0917	0.003782
100	5500.00	21.1349	0.007207
120	5600.00	20.5116	0.006994
140	5700.00	20.5116	0.006994

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

(5.8GHz) Output Power Into Antenna & RF Exposure Evaluation Distance (2.34dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
172	5860.00	13.6458	0.004653
176	5880.00	13.5519	0.004621
180	5900.00	13.2130	0.004505

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