

RF Exposure Evaluation declaration

Product Name : Mini PCI Card

Model No.: MS-6833

FCC ID: I4L-MS6833

Applicant : MICRO-STAR INT'L Co., LTD

Address : No 69, Li-De st., Jung-He City, Taipei Hsien, Taiwan, R.O.C

Date of Receipt : Feb. 18. 2004

Date of Declaration : Feb. 27. 2004

Report No. : 042L121FI

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/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 : Mini PCI Card
Test Item : RF Exposure Evaluation
Test Site : No.3 OATS

Antenna Gain

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

(802.11b FIC Antenna)

Output Power Into Antenna & RF Exposure Evaluation Distance (1.56 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.1799
6	2437.00	9.0573	0.1652
11	2462.00	10.1625	0.1853

(802.11g FIC Antenna)

Output Power Into Antenna & RF Exposure Evaluation Distance (1.56 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.3890
6	2437.00	19.4536	0.3547
11	2462.00	21.8273	0.3980

(802.11b M300N Antenna)

Output Power Into Antenna & RF Exposure Evaluation Distance (-2.42 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.0719
6	2437.00	9.0573	0.0661
11	2462.00	10.1625	0.0741

(802.11g M300N Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (-2.42 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.1556
6	2437.00	19.4536	0.1419
11	2462.00	21.8273	0.1592

(802.11b CLEVO 5600 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (-0.45dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.1132
6	2437.00	9.0573	0.1040
11	2462.00	10.1625	0.1167

(802.11g CLEVO 5600 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (-0.45dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.2449
6	2437.00	19.4536	0.2233
11	2462.00	21.8273	0.2506

(802.11b MS-1002 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (2.99 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.2500
6	2437.00	9.0573	0.2296
11	2462.00	10.1625	0.2576

(802.11g MS-1002 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (2.99 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.5406
6	2437.00	19.4536	0.4931
11	2462.00	21.8273	0.5532

(802.11b 258KA0 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (0.13 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.1294
6	2437.00	9.0573	0.1188
11	2462.00	10.1625	0.1333

(802.11g 258KA0 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (0.13 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.2798
6	2437.00	19.4536	0.2552
11	2462.00	21.8273	0.2864

(802.11b ADA3P-713K601 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (2 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.1990
6	2437.00	9.0573	0.1828
11	2462.00	10.1625	0.2051

(802.11g ADA3P-713K601 Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (2 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.4304
6	2437.00	19.4536	0.3926
11	2462.00	21.8273	0.4405

(802.11b CLEVO 285P Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (0.47 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.1399
6	2437.00	9.0573	0.1285
11	2462.00	10.1625	0.1442

(802.11g CLEVO 285P Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (0.47 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.3026
6	2437.00	19.4536	0.2760
11	2462.00	21.8273	0.3097

(802.11b E12B Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (1.92 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.1954
6	2437.00	9.0573	0.1794
11	2462.00	10.1625	0.2013

(802.11g E12B Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (1.92 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.4226
6	2437.00	19.4536	0.3854
11	2462.00	21.8273	0.4324

(802.11b CLEVO 888E Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (3.12 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	9.8628	0.2576
6	2437.00	9.0573	0.2365
11	2462.00	10.1625	0.2654

(802.11g CLEVO 888E Antenna)
Output Power Into Antenna & RF Exposure Evaluation Distance (3.12 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 2.5 cm (mW/cm ²)
1	2412.00	21.3304	0.5571
6	2437.00	19.4536	0.5081
11	2462.00	21.8273	0.5700

The distance r (4th column) calculated from the Friis transmission formula is far shorter than 2.5 cm separation requirement.