FCC ID: HZB-C38WCW

RF EXPOSURE REPORT

REPORT NO.: RF920722R01
MODEL NO.: C38WCW

ACCORDING: FCC Guidelines for Human Exposure
IEEE C95.1

APPLICANT: Proxim Corporation

ADDRESS: 935 Stewart Drive, Sunnyvale, CA 94085, USA

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.

Lab Code: 200376-0

RF Exposure Measurement

1. Introduction

In this document, we try to prove the safety of radiation harmfulness to the human body for our product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The Gain of the antenna used in this product is measured in a Fully Anechoic Chamber (FAC) calibrated for antenna measurement in ADT, and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis transmission formula is a far field assumption, the calculated result of that is an over-prediction for near field power density. We will take that as the worst case to specify the safety range.

2. RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental 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 Exposure				
300-1500	…	…	F/1500	6
1500-100,000	…	…	1.0	30

F = Frequency in MHz

3. Friis Formula

Friis transmission formula : Pd = (Pout*G) / (4*pi*r^2)

where
Pd = power density in mW/cm^2
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, 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 MPE value at distance 20cm.

Ref. : David K. Cheng, *Field and Wave Electromagnetics*, Second Edition, Page 640, Eq. (11-133).

4 EUT Operating condition

The software provided by Manufacturer enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

5. Classification

The antenna of the product, under normal use condition, is at least 20 cm away from the body of the user. Warning statement for keeping 20cm separation distance and the prohibition of operating next to a person has been printed on the users manual. So, this product is classified as the **Mobile Device**.

6 Test Results

6.1 Antenna Gain

Antenna 1:

The effective antenna gain measured in Fully Anechoic Chamber is 3dBi or 2.0 (numeric) for 2.4GHz ;

5 dBi or 3.16 (numeric) for 5GHz.

Antenna 2:

The effective antenna gain measured in Fully Anechoic Chamber is 8.3 dBi or 6.76 (numeric).

Antenna 3:

The effective antenna gain measured in Fully Anechoic Chamber is 12.3 dBi or 16.98 (numeric).

Antenna 4:

The effective antenna gain measured in Fully Anechoic Chamber is –0.2dBi or 0.95 (numeric).

Antenna 5:

The effective antenna gain measured in Fully Anechoic Chamber is 11.8 dBi or 15.14 (numeric).

Antenna 7:

The effective antenna gain measured in Fully Anechoic Chamber is 3dBi or 2.0 (numeric) for 2.4GHz ;

6 dBi or 3.98 (numeric) for 5GHz

Antenna 8:

The effective antenna gain measured in Fully Anechoic Chamber is 2.5 dBi or 1.78(numeric) for 2.4GHz ;
5.5 dBi or 3.55 (numeric) for 5GHz.

6.2 Output Power Into Antenna & RF Exposure value at distance 20cm:

FOR Antenna 1:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	100.00	0.0397	1.0
6	2437	105.20	0.0418	1.0
11	2462	109.40	0.0434	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	87.30	0.0347	1.0
6	2437	83.95	0.0333	1.0
11	2462	81.47	0.0323	1.0

FOR Antenna 2:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	45.50	0.0612	1.0
6	2437	42.07	0.0566	1.0
11	2462	48.98	0.0659	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	33.42	0.0449	1.0
6	2437	37.24	0.0501	1.0
11	2462	33.88	0.0456	1.0

FOR Antenna 3:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	15.45	0.0522	1.0
6	2437	15.00	0.0507	1.0
11	2462	15.60	0.0527	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	9.33	0.0315	1.0
6	2437	9.57	0.0323	1.0
11	2462	9.10	0.0307	1.0

FOR Antenna 4:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	100.00	0.0190	1.0
6	2437	105.20	0.0200	1.0
11	2462	109.40	0.0208	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	87.30	0.0166	1.0
6	2437	83.95	0.0159	1.0
11	2462	81.47	0.0155	1.0

FOR Antenna 5:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	15.96	0.0481	1.0
6	2437	16.75	0.0504	1.0
11	2462	18.20	0.0548	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	11.35	0.0342	1.0
6	2437	11.12	0.0335	1.0
11	2462	11.75	0.0354	1.0

FOR Antenna 7:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	100.00	0.0397	1.0
6	2437	105.20	0.0418	1.0
11	2462	109.40	0.0434	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	87.30	0.0347	1.0
6	2437	83.95	0.0333	1.0
11	2462	81.47	0.0323	1.0

FOR Antenna 8:

For Part 802.11b:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	32.28	0.0114	1.0
6	2437	34.36	0.0122	1.0
11	2462	38.64	0.0137	1.0

For Part 802.11g:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	2412	32.51	0.0115	1.0
6	2437	33.81	0.0120	1.0
11	2462	38.28	0.0135	1.0

Antenna 1:
FOR FREQUENCY 5.15~5.35GHz

Normal Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	5180	45.60	0.0287	1.0
4	5240	47.32	0.0298	1.0
5	5260	80.17	0.0504	1.0
8	5320	80.35	0.0506	1.0

Turbo Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
1	5210	49.55	0.0312	1.0
2	5250	46.99	0.0296	1.0
3	5290	83.18	0.0523	1.0

FOR FREQUENCY 5.725~5.850GHz

Normal Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
9	5745	83.75	0.0527	1.0
11	5785	83.18	0.0523	1.0
13	5825	92.04	0.0579	1.0

Turbo Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
4	5760	82.60	0.0520	1.0
5	5800	86.90	0.0547	1.0

Antenna 7:
FOR FREQUENCY 5.25~5.35GHz

Normal Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
5	5260	80.17	0.0635	1.0
8	5320	80.35	0.0636	1.0

Turbo Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
3	5290	83.18	0.0659	1.0

FOR FREQUENCY 5.725~5.850GHz

Normal Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
9	5745	83.75	0.0663	1.0
11	5785	83.18	0.0659	1.0
13	5825	92.04	0.0729	1.0

Turbo Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
4	5760	82.60	0.0654	1.0
5	5800	86.90	0.0688	1.0

Antenna 8:
FOR FREQUENCY 5.25~5.35GHz

Normal Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
5	5260	33.42	0.0236	1.0
8	5320	33.88	0.0239	1.0

Turbo Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
3	5290	32.43	0.0229	1.0

FOR FREQUENCY 5.725~5.850GHz

Normal Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
9	5745	34.51	0.0244	1.0
11	5785	33.65	0.0238	1.0
13	5825	32.58	0.0230	1.0

Turbo Mode :

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
4	5760	31.92	0.0225	1.0
5	5800	32.36	0.0228	1.0