RF Maximum Permissible Exposure Measurement Report

of

E.U.T. : CDPD Transceiver

MODEL : Z CARD 210

FCC ID. : M4Y-ZCARD210

for

APPLICANT : Z-COM, INC.

ADDRESS : 7F-2, NO. 9, PROSPERITY 1ST RD., SCIENCE-BASED INDUSTRIAL PARK, HSINCHU, TAIWAN, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN

NO. 8 LANE 29, WENMIMG ROAD,

LOSHAN TSUN, KWEISHAN HSIANG,

TAOYUAN, TAIWAN, R.O.C.

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Report Number : ET88R-10-032

TEST REPORT CERTIFICATION

Applicant	: Z-COM, INC. 7F-2, NO. 9, PROSPERITY 1ST RD., SCIENCE-BASED INDUSTRIAL PARK, HSINCHU, TAIWAN, R.O.C.
Manufacturer	: Z-COM, INC. 7F-2, NO. 9, PROSPERITY 1ST RD., SCIENCE-BASED INDUSTRIAL PARK, HSINCHU, TAIWAN, R.O.C.
Description of EUT	:
a) Type of EUT	: CDPD Transceiver
b) Model No.	: Z CARD 210
c) FCC ID.	: M4Y-ZCARD210
d) Power Supply	: DC 5V
Regulation Applied	: IEEE C95.1-1991, FCC 47 CFR Part 1 and Part 2

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in IEEE C95.1, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relates only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC.

Issued Date : MAR. 29, 2000

Test Engineer : K. C. Chen
(K. C. Chen)

Approve & Authorized Signer : Will Yauo
Will Yauo, Supervisor
EMI Test Site of ELECTRONICS
TESTING CENTER, TAIWAN

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Wireless LAN Card
b) Trade Name : Z-Com
c) Model No. : Z CARD 210
d) Power Supply : DC 5V

1.2 Characteristics of Device

This device is a CDPD wireless modem and its maximum rated output peak power is 0.6W. this device uses GMSK modulation for wireless transmission. It is for data transmission only, no audio or voice signal operation is avaible. This device also meets the CDPD wireless standards Ver. 1.0 and 1.1 and supports UDC/TCP communication protocol for accessing the Internet and CDPD network.

1.3 Test Methodology

The Maximum Permissible Exposure (MPE) was performed according to the procedures illustrated in IEEE C95.1-1991.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, 5 Lirn, Din Fu Tsun, Lin Kou, Taipei, Taiwan, R.O.C.
This site has been fully described in a report submitted to the FCC, and accepted in a letter dated Feb. 10, 1997.

2 PROVISIONS APPLICABLE

2.1 Definition

MPE in Occupational / Controlled Environments:

Persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Also apply to a individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potatial for exposure.

MPE in General Population / Uncontrolled Environments:

General population / Uncontrilled exposure apply in situation in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment nay not be fully aware of the potatial for exposure or cannot execise control over their exposure.

2.2 Relative Requirement for Compliance

(1) MPE for Controlled Enviroments

According to section 1.1310 of FCC 47 CFR Part 1, MPE Limits for controlled enviroment are as following:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
0.3-3.0	614	1.63	*100	6
3-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1500	-----	-----	f/300	6
1500-100,000	-----	-----	5.0	6

(2) MPE for Uncontrolled Enviroments

According to section 1.1310 of FCC 47 CFR Part 1, MPE Limits for uncontrolled enviroment are as following:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
0.3-3.0	614	1.63	*100	30
3-30	1842/f	4.89/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1500	-----	-----	f/1500	30
1500-100,000	-----	-----	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power desity

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion, as a customer would normally use it. The MPE measurement was performed under the setting of maximum RF transmitting power, that is, sets the power level to the class of "0". And measured on lowest, middle, and highest frequencies to demostrate the whole used band is complied with the requirement. Further, measurement was made on every possible azimuth arround the transmitting structure. Therefore, we can make sure that the MPE testing was performed under the wost case.

3.2 Devices for Tested System

Device	Manufacture	Model	Cable Description
CDPD Transceiver *	Z-COM, INC.	Z CARD 210	3m Antenna connected cable

Remark "*" means device under test.

4 Maximum Permissible Exposure Measurement

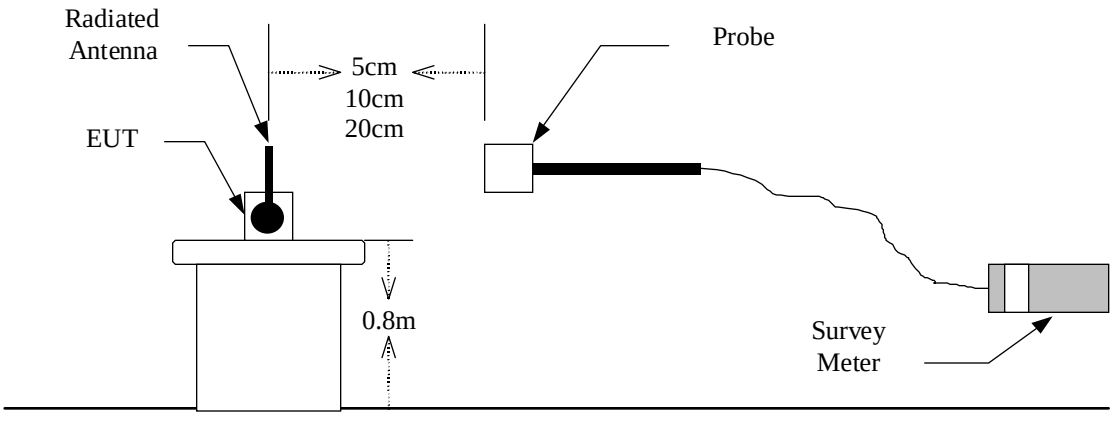
4.1 Applicable Standard

For this intentional radiator are used with any possible people, therefore the **Uncontrolled Enviroment Condition** is applied. And the MPE requirement is as descibed in section 2.2 of this test report.

4.2 Measurement Procedure

(1) Set up the device under test (DUT) as its normal using configuration. Please see figure 1.
(2) Calibrate the probe system so that the meter displays zero, and then power on the DUT.
(3) Scan the antenna of DUT with a proper spacer of 5 cm in vertical axis and keep vertical scanning around the antenna, and pick up the maximum data with Max. Hold function.
(4) Repeat step (3) by changing the spacer to 10 cm and then 20 cm till the field from DUT is too weak to be measured.
(5) Record the maximum value appeared.

Figure 1 : Measurement configuration



4.3 Measurement Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Next Cal. Due
Survey Meter	Narda	8712	Jan. 30, 2001
Probe	Narda	8721D	Jan. 30, 2001

4.4 Power Desity Data

Operation Mode : Maximum Data Transmitting Rate
Transmitting Frequency : 824.04 to 848.970 MHz
Rated Maximum Output Power : 0.6W
Measured Output Peak Power : 0.63W (ERP)
Test Date : Apr. 08, 2000 Temperature : 25 • Humidity : 70%

Measured Frequency MHz	Measured @ 25cm mW/cm^2	Measured @ 20cm mW/cm^2	Measured @ 15cm mW/cm^2	Measured @ 10cm mW/cm^2	Probe Factor	Maximum Result @10cm mW/ cm^2	MPE Limt mW/cm^2
824.04	---	---	0.02	0.32	0.82	0.26	0.55
836.01	---	---	0.01	0.28	0.82	0.23	0.56
848.97	---	---	0.01	0.28	0.82	0.23	0.57

Note :

1. Remark "---" means that the emission level is too low to be measured (the precise accuracy of the measurement system is 0.01 mW/ cm^2).
2. Value 0.82 is a corrected factor of measurement system.
3. Result = Value Measured X Corrected Factor.
4. The measurement was performed under the condition of fixed the emission frequency to get the most extreme MPE.

Appendix A Specification of Device Under Test

Z-Com, Inc.

A Wireless Networking Company

7F-2, No.9, Prosperity 1st Rd.,
Science-Based Industrial Park,
Hsinchu, Taiwan
Tel : 886-3-5777364
Fax : 886-3-5773359

Z-Card 210 Spec

General•

- ❑ Frequency: Transmitting: 824.01~848.97 MHz (30KHz)
  806.0125~824.9875 MHz (25KHz)
  Receiving: 869.01~893.97 MHz (30KHz)
  851.0125~869.9875 MHz (25KHz)
- ❑ Channel Spacing: 30KHz for global market
  25KHz for Taiwan
- ❑ RF Power Output: 0.6W (ERP)

Power supply•

- ❑ Power Supply Voltage: 3.6V •Lithium Ion Rechargeable Battery•
  5V •PC Card Interface•
- ❑ Power consumption• Full Duplex•800mA(max), 650mA (typical)
  Listen Mode•200mA(typical)
  Sleep Mode•80mA(max), 70mA (typical)
- ❑ Power• 5V DC

RF Specification•

Receiver RF Sensitivity:

- ❑ Sensitivity in A.W.G.N.: -113dBm
- ❑ Sensitivity in Rayleigh Fading: -100dBm at 8 km/hr
  -101dBm at 50 km/hr
  -102dBm at 100 km/hr

Transmitter Minimum Performance:

- ❑ Power Control: 10 level from –2 dBW to –22 dBW,
  each class is 4 dB down.
- ❑ Frequency Stability: ±2.5ppm•30KHz••±1.5ppm•25KHz•

Environment Condition

- ❑ Humidity• 95% non-condensing
- ❑ Operating Temperature: 0• to 50•
- ❑ Storage Temperature: -20• to 85•

System Requirement

- ❑ Data interface•Standard PCMCIA II
- ❑ OS•Windows 95/98, NT 4.0, CE

Communication Interface

- ❑ Host Protocol•SLIP•PPP