RF EXPOSURE REPORT

REPORT NO.:	SA110726E01A
MODEL NO.:	FD-400TiC
FCC ID:	MQT-FD400TIC
RECEIVED:	July 26, 2011
ISSUED:	Oct. 19, 2011

APPLICANT:	XAC Automation Corporation
ADDRESS:	4F, NO. 30, INDUSTRY E. RD. IX, SCIENCE-BASED INDUSTRIAL PARK, HSINCHU, TAIWAN

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA110726E01A	Original release	Oct. 19, 2011

1. CERTIFICATION

PRODUCT: Portable Terminal
BRAND: First Data
MODEL: FD-400TiC
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: XAC Automation Corporation
STANDARDS: FCC Part 2 (Section 2.1091)
FCC OET Bulletin 65, Supplement C (01-01)
IEEE C95.1

The above equipment (Model: FD-400TiC) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** *Oct. 19, 2011*
(Claire Kuan, Specialist)

APPROVED BY : _____ , **DATE:** *Oct. 19, 2011*
(May Chen, Deputy Manager)

2. RF EXPOSURE LIMIT

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)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
1.34-30	824/f	2.19/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

3. MPE CALCULATION 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. 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. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. CALCULATION RESULT

For RF ID:

Channel Frequency (MHz)	Electric field (dBuV/m)	Electric field (V/m)	Limit of Electric field (V/m)
13.56	53.6	0.0005	60.77

Note: Limit of Electric field=824/f

Channel Frequency (MHz)	Electric field (V/m)	POWER DENSITY (mW/ $cm^{2)}$
13.56	0.0005	$66*10^{-11}$

Note: Power density and field intensity are related by equation:

$$P_D = \frac{E^2}{Z_0} = \frac{E^2}{120\pi} = \frac{E^2}{377}$$

CALCULATION FOR MAXIMUM CONDUCTED POWER

For FCC Part 22H:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
190	836.6	1737.8	1.65	20	0.506	0.55

Note: Limit of Power Density =F/1500

For FCC Part 24E:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
810	1909.8	812.8	1.65	20	0.236	1

CONCLUSION:

Both of the RFID and 2G/3G can transmit simultaneously, the formula of calculated the MPE is:

$CPD_1 / LPD_1 + CPD_2 / LPD_2$ + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

For RFID + FCC Part 22H

Therefore, the worst-case situation is 0.001 / 1 + 0.506 / 0.55 = 0.931, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

For RFID + FCC Part 24E

Therefore, the worst-case situation is 0.001 / 1 + 0.236 / 1 = 0.237, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

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