



RF EXPOSURE REPORT

REPORT NO.: SA110726E01

MODEL NO.: FD-400GT

FCC ID: MQT-FD400GT

APPLICANT: XAC Automation Corporation

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TAIWAN

ISSUED BY: Bureau Veritas Consumer Products Services
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA110726E01	Original release	Sep. 05, 2011



1. CERTIFICATION

PRODUCT: Transaction Terminal

BRAND: First Data

MODEL: FD-400GT

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-400GT) 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:** Sep. 05, 2011
(Claire Kuan, Specialist)

APPROVED BY :  , **DATE:** Sep. 05, 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

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

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. 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 OF MAXIMUM CONDUCTED POWER

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:

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

For 2G:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW) (EIRP)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
810	1909.8	1288.2	0.256	1.0

For 3G:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW) (ERP)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
251	836.6	1258.9	0.250	0.5577

Note: Limit of Electric field=F/1500

CONCLUSION:

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

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

For RFID + 2G

Therefore, the worst-case situation is $0.001 / 1 + 0.256 / 1 = 0.257$, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

For RFID + 3G

Therefore, the worst-case situation is $0.001 / 1 + 0.250 / 0.5577 = 0.449$, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

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