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RF EXPOSURE REPORT

REPORT NO.: SA120306E02

MODEL NO.: FD-400GT-CDMA

FCC ID: MQT-FD400GTCDMA

APPLICANT: XAC Automation Corporation

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SCIENCE-BASED INDUSTRIAL PARK, HSINCHU,
TAIWAN

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|-------------|-------------------|---------------|
| SA120306E02 | Original release | Apr. 13, 2012 |



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1. CERTIFICATION

PRODUCT: Portable Terminal

BRAND: First Data

MODEL: FD-400GT-CDMA

TEST SAMPLE: R&D 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-CDMA) 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:** Apr. 13, 2012
(Claire Kuan, Specialist)

APPROVED BY : , **DATE:** Apr. 13, 2012
(May Chen, Deputy Manager)



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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

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

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

P_i = 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

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) | ERP Output Power to Antenna (mW) | DISTANCE (cm) | Power Density (mW/cm ²) | Limit of Power Density (mW/cm ²) |
|---------|-------------------------|----------------------------------|---------------|-------------------------------------|--|
| 777 | 848.31 | 208.449 | 20 | 0.068 | 0.5655 |

Note: Limit of Power Density =F/1500

For FCC Part 24E:

| Channel | Channel Frequency (MHz) | EIRP Output Power to Antenna (mW) | DISTANCE (cm) | Power Density (mW/cm ²) | Limit of Power Density (mW/cm ²) |
|---------|-------------------------|-----------------------------------|---------------|-------------------------------------|--|
| 1175 | 1908.75 | 222.331 | 20 | 0.044 | 1 |

CONCLUSION:

Both of the RFID and 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



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For RFID + FCC Part 22H

Therefore, the worst-case situation is $0.001 / 1 + 0.068 / 0.5655 = 0.12$, 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 $0.001 / 1 + 0.044 / 1 = 0.045$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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