



# RF EXPOSURE REPORT

**REPORT NO.:** SA130902E05A

**MODEL NO.:** xAPT-103PUW, FD410

**FCC ID:** MQT-XAPT103PUW

**RECEIVED:** Sep. 02, 2013

**TESTED:** Sep. 24 to Oct. 10, 2013

**ISSUED:** Oct. 25, 2013

**APPLICANT:** XAC AUTOMATION CORP.

**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, R.O.C.

**TEST LOCATION (1):** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung  
Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307,  
Taiwan, R.O.C.

**TEST LOCATION (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan,  
R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

## TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	3
1 CERTIFICATION .....	4
2 EVALUATION RESULT .....	5
3 SAR TEST EXCLUSION THRESHOLDS .....	6
3.1 SAR TEST EXCLUSION THRESHOLDS - GSM AND WCDMA.....	6
3.2 SAR TEST EXCLUSION THRESHOLDS - WLAN.....	8
3.3 SAR TEST EXCLUSION THRESHOLDS - RFID.....	10



A D T


## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA130902E05A	Original release	Oct. 25, 2013

## 1 CERTIFICATION

**PRODUCT:** Terminal  
**BRAND NAME:** XAC, First Data  
**MODEL NO.:** xAPT-103PUW, FD410  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** XAC AUTOMATION CORP.  
**TESTED DATE:** Sep. 24 to Oct. 10, 2013  
**STANDARDS:** FCC Part 2 (Section 2.1091)  
FCC OET Bulletin 65, Supplement C (01-01)  
IEEE C95.1

The above equipment (Model: xAPT-103PUW) 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. 25, 2013  
( Claire Kuan, Specialist )

**APPROVED BY :**  , **DATE:** Oct. 25, 2013  
( May Chen, Manager )

## 2 EVALUATION RESULT

### Following FCC KDB 447498 D01 “General SAR test exclusion guidance”

The corresponding SAR Exclusion Threshold condition, listed below:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

2) At 100 MHz to 6 GHz and for test separation distances  $> 50$  mm, the SAR test exclusion threshold is determined according to the following:

- a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100MHz to 1500 MHz
- b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at  $> 1500$  MHz and  $\leq 6$  GHz

3) At frequencies below 100 MHz, the following may be considered for SAR test exclusion.

- a) The threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by  $[1 + \log(100/f(\text{MHz}))]$  for test separation distances  $> 50$  mm and  $< 200$  mm.
- b) The threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by  $\frac{1}{2}$  for test separation distances  $\leq 50$  mm.
- c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

### 3 SAR TEST EXCLUSION THRESHOLDS

#### 3.1 SAR TEST EXCLUSION THRESHOLDS - GSM AND WCDMA

##### **Smallest distance from the antenna and radiating structures or outer surface of the device**

The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. (See below figure)





### Source-base Time Average Power Table (Cellular mode)

GPRS Mode:

Frequency (MHz)	Conducted power (dBm)	Conducted power (mW)	Source-based time-averaged conducted output power (mW)
848.8	32.6	1819.7	455
1850.2	29	794.3	198.6

Note: Calculations for RF Exposure compliance in the cellular and PCS bands are based on the maximum source based time-average power obtained from 2-Slot GPRS operation. The resulting duty cycle factor is 2/8, or 6.02dB.

### SAR Test Exclusion Thresholds (Cellular mode)

Frequency	Max. Power (mW)* <sup>1</sup>	Min. test separation distance (mm)	SAR test exclusion power thresholds * <sup>2</sup> (mW)	Result
848.8	455	90	633	Pass
1850.2	198.6	90	675	Pass

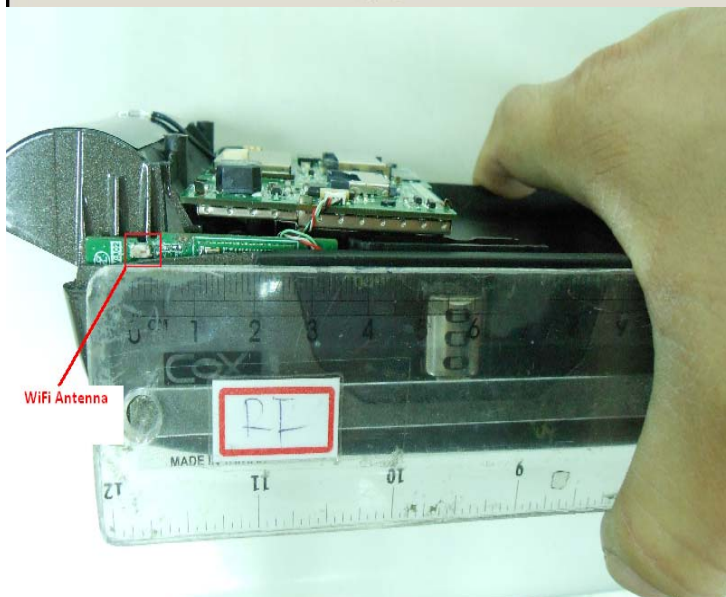
\*<sup>1</sup> Max. power obtained from maximum source based time average power.

\*<sup>2</sup> Calculate SAR test exclusion thresholds from “ 1 ) & 2 ) ” formulas. (based on 10-g body SAR exclusion thresholds)

### 3.2 SAR TEST EXCLUSION THRESHOLDS - WLAN

#### Smallest distance from the antenna and radiating structures or outer surface of the device

The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. (See below figure)





### WiFi Power Table

Mode	Frequency (MHz)	Peak Conducted power (dBm)	Average Conducted power (dBm)
11b	2412	18.50	16.50
	2437	18.59	16.45
	2462	18.79	16.60
11g	2412	20.00	14.54
	2437	20.56	14.79
	2462	20.71	15.00
11n-HT20	2412	19.97	14.52
	2437	20.64	14.82
	2462	20.60	14.90
11n-HT40	2412	20.25	13.61
	2437	20.61	14.91
	2462	20.71	14.00

### Maximum Average power for WiFi Mode:

Mode	Frequency (MHz)	Peak Conducted power (dBm)	Average Conducted power (dBm)	Average Conducted power (mW)
11b	2462	18.79	16.6	45.7

### SAR Test Exclusion Thresholds (WiFi Mode)

Frequency (MHz)	Max. Power (mW)* <sup>1</sup>	Min. test separation distance (mm)	SAR test exclusion power thresholds * <sup>2</sup> (mW)	Result
2412	45.7	75	491.4	Pass

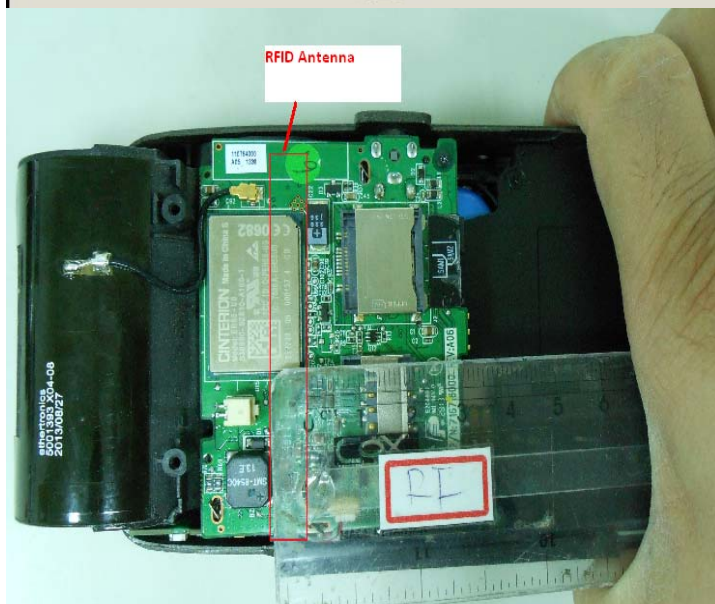
\*<sup>1</sup> Max. power obtained from maximum average power.

\*<sup>2</sup> Calculate SAR test exclusion thresholds from “ 1 ) & 2 ) ” formulas. (base on 10-g extremity SAR exclusion thresholds)

### 3.3 SAR TEST EXCLUSION THRESHOLDS - RFID

#### Smallest distance from the antenna and radiating structures or outer surface of the device

The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. (See below figure)



## RFID Power Table

Mode	Frequency (MHz)	Electric field (dBuV/m) @10m	EIRP (dBm)
RFID	13.56	69.9	-25.3

Field strength is then converted to EIRP as follows:

(i)  $EIRP = ((E*d)^2) / 30$

where:

E is the field strength in V/m;

d is the measurement distance in meters;

EIRP is the equivalent isotropically radiated power in watts.

(ii) Working in dB units, the above equation is equivalent to:  $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$

(iii) Or, if d is 3 meters:  $EIRP[dBm] = E[dB\mu V/m] - 95.2$

## SAR Test Exclusion Thresholds (RFID Mode)

Frequency (MHz)	Max. Power (mW)* <sup>1</sup>	Min. test separation distance (mm)	SAR test exclusion power thresholds * <sup>2</sup> (mW)	Result
13.56	0.00309	≤ 50 mm	2264	Pass

\*<sup>1</sup> Max. power obtained from maximum EIRP.

\*<sup>2</sup> Calculate SAR test exclusion thresholds from “3” formulas. (base on 10-g extremity SAR exclusion thresholds)

## Conclusion

Since Source-base time average power is below SAR test exclusion power thresholds, the SAR evaluation is not required.

--- END ---