



# RF EXPOSURE REPORT

**REPORT NO.:** SA131029E03  
**MODEL NO.:** xAPT-103WiFi.3G  
**FCC ID:** MQT-XAPT103WIFI3G  
**RECEIVED:** Dec. 14, 2012  
**TESTED:** Jan. 08, 2013 and Oct. 31, 2013  
**ISSUED:** Nov. 29, 2013

**APPLICANT:** XAC AUTOMATION CORP.

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## RELEASE CONTROL RECORD

| ISSUE NO.   | REASON FOR CHANGE | DATE ISSUED   |
|-------------|-------------------|---------------|
| SA131029E03 | Original release  | Nov. 29, 2013 |

## 1. CERTIFICATION

**PRODUCT:** Terminal  
**BRAND NAME:** XAC  
**MODEL NO.:** xAPT-103WiFi.3G  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** XAC AUTOMATION CORP.  
**TESTED DATE:** Jan. 08, 2013 and Oct. 31, 2013  
**STANDARDS:** FCC Part 2 (Section 2.1091)  
FCC OET Bulletin 65, Supplement C (01-01)  
IEEE C95.1

The above equipment (Model: xAPT-103WiFi.3G) 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** : Phoenix Huang , **DATE:** Nov. 29, 2013  
( Phoenix Huang, Specialist )

**APPROVED BY** : May Chen , **DATE:** Nov. 29, 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           | 32.3                  | 1698.2               | 424.6  |
| 1909.8          | 29.4                  | 871                  | 217.8  |

Note: Calculations for RF Exposure compliance in the cellular and PCS bands are base 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     | 424.6                         | 90                                 | 633  | Pass   |
| 1909.8    | 217.8                         | 90                                 | 675  | Pass   |

\*1 Max. power obtained from maximum source based time average power.

\*2 Calculate SAR test exclusion thresholds from “ 1) & 2) ” formulas. (base on 10-g body SAR exclusion thresholds)



### 3.2 SAR TEST EXCLUSION THRESHOLDS – WIFI

#### 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            | 15.07                      | 12.95                         |
|          | 2437            | 15.14                      | 13.05                         |
|          | 2462            | 15.24                      | 13.21                         |
| 11g      | 2412            | 21.13                      | 13.19                         |
|          | 2437            | 21.05                      | 13.29                         |
|          | 2462            | 20.85                      | 13.10                         |
| 11n-HT20 | 2412            | 20.74                      | 13.24                         |
|          | 2437            | 20.52                      | 13.13                         |
|          | 2462            | 20.73                      | 13.31                         |
| 11n-HT40 | 2412            | 20.12                      | 13.09                         |
|          | 2437            | 20.07                      | 13.13                         |
|          | 2462            | 20.14                      | 13.27                         |

Maximum Average power for WiFi Mode:

| Mode | Frequency (MHz) | Peak Conducted power (dBm) | Average Conducted power (dBm) | Average Conducted power (mW) |
|------|-----------------|----------------------------|-------------------------------|------------------------------|
| 11g  | 2437            | 21.05                      | 13.29                         | 21.33                        |

**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 |
|-----------------|-------------------------------|------------------------------------|---|--------|
| 2437            | 21.33                         | 5                                  | 24  | 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           | 61.14                        | -23.66     |

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 10 meters:  $EIRP[dBm] = E[dB\mu V/m] - 84.8$

### 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           | 0.004365                      | ≤ 50 mm                            | 593  | Pass   |

\*1 Max. power obtained from maximum EIRP.

\*2 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.

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