



# RF EXPOSURE REPORT

**REPORT NO.:** SA130902E05

**MODEL NO.:** xAPT-103PU

**FCC ID:** MQT-XAPT103PU

**RECEIVED:** Sep. 02, 2013

**TESTED:** Sep. 24, 2013

**ISSUED:** Oct. 09, 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.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA130902E05	Original release	Oct. 09, 2013



## 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.

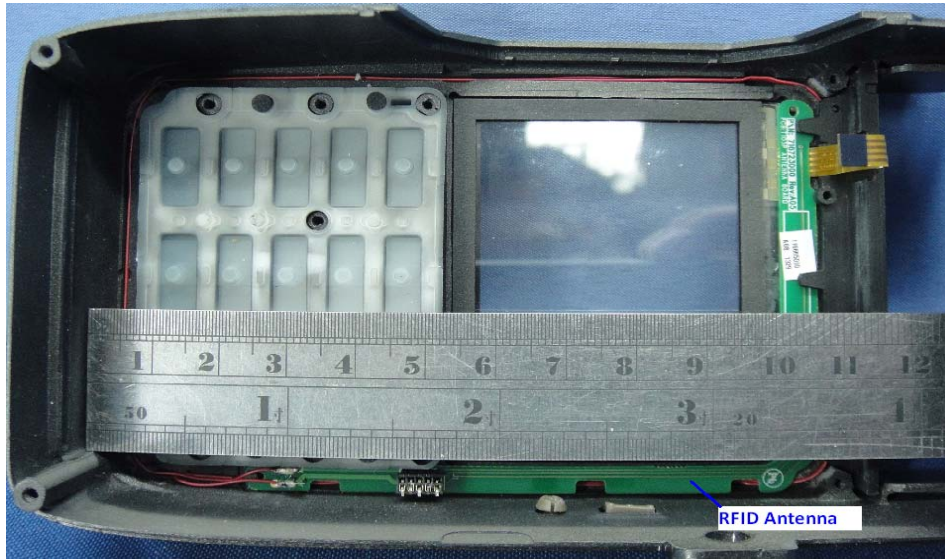
### 3 SAR TEST EXCLUSION THRESHOLDS

#### 3.1 SAR TEST EXCLUSION THRESHOLDS - 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)





**Power table**

Mode	Frequency (MHz)	Electric field (dBuV/m) @3m	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 10 meters:  $EIRP[dBm] = E[dB\mu V/m] - 84.8$

If d is 3meters:  $EIRP[dBm] = E[dB\mu V/m] - 95.2$

**SAR Test Exclusion Thresholds**

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	0.002951	≤ 50 mm	593	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 maximum EIRP is below SAR test exclusion power thresholds, the SAR evaluation is not required.

### 3.2 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

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	794.32	198.61

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

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	80	576.74	Pass
1850.2	198.61	80	575.67	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.  
(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 ---**