# RF EXPOSURE REPORT

| | |
|---|---|
| **Product:** | Integrated Smart Terminal |
| **Model Name:** | E800 |
| **FCC ID:** | V5PE800 |
| **Applicant:** | PAX Technology Limited |
| **Address:** | Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong |
| **Manufacturer:** | PAX Computer Technology (Shenzhen) Co., Ltd. |
| **Address:** | 4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C. |
| **Prepared by:** | BV 7Layers Communications Technology (Shenzhen) Co. Ltd |
| **Lab Location:** | No.B102, Dazu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China |
| **TEL:** | +86 755 8869 6566 |
| **FAX:** | +86 755 8869 6577 |
| **E-MAIL:** | customerservice.dg@cn.bureauveritas.com |
| **Report No.:** | SA180522W005 |
| **Received Date:** | May 25, 2018 |
| **Test Date:** | May 26, 2018 ~ Jul. 06, 2018 |
| **Issued Date:** | Jul. 10, 2018 |

This report should not be used by the client to claim product certification, approval, or endorsement by A2LA or any government agencies.

# TABLE OF CONTENTS

# RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---|---|---|
| SA180522W005 | Original release | Jul. 10, 2018 |

# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT:** | Integrated Smart Terminal |
| **BRAND NAME:** | PAX |
| **MODEL NAME:** | E800 |
| **APPLICANT:** | PAX Technology Limited |
| **TESTED:** | May 26, 2018 ~ Jul. 06, 2018 |
| **TEST SAMPLE:** | Production Unit |
| **STANDARDS:** | **FCC Part 2 (Section 2.1091)**<br>**FCC OET Bulletin 65, Supplement C (01-01)**<br>**KDB 447498 D01 General RF Exposure Guidance v06**<br>IEEE C95.1 |

The above equipment has been tested by **BV 7Layers Communications Technology (Shenzhen) Co. Ltd** 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:** Jul. 10, 2018
(Roger Li/ Engineer)

**APPROVED BY :** _____ , **DATE:** Jul. 10, 2018
( Sam Tung / Manager)

# 2 GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| **PRODUCT** | Integrated Smart Terminal | |
| **MODEL NAME** | E800 | |
| **NOMINAL VOLTAGE** | 24Vdc (adapter or host equipment)<br>7.2Vdc (Li-ion, battery) | |
| **OPERATING TEMPERATURE RANGE** | 0 ~ 50℃ | |
| **MODULATION TYPE** | **WLAN** | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM |
| | **BT_LE** | DTS |
| | **Bluetooth** | GFSK, π/4-DQPSK, 8DPSK |
| | **WCDMA** | BPSK/QPSK |
| | **LTE** | QPSK/16QAM |
| | **NFC** | ASK |
| **OPERATING FREQUENCY** | **WLAN** | 2412 ~ 2472MHz for 11b/g/n(HT20)<br>2422 ~ 2462MHz for 11n(HT40)<br>5150 ~ 5250MHz, 5250 ~ 5350MHz,<br>5470 ~ 5725MHz, 5725 ~ 5825MHz<br>for 11a/n(HT20)/n(HT40)/ac(HT80) |
| | **Bluetooth/BT_LE** | 2402MHz ~ 2480MHz |
| | **WCDMA** | 1852.4MHz ~ 1907.6MHz<br>(FOR WCDMA Band 2)<br>826.4MHz ~ 846.6MHz<br>(FOR WCDMA Band 5) |
| | **LTE** | 1850.7MHz ~ 1909.3MHz (FOR LTE Band2)<br>1710.7MHz ~ 1754.3MHz (FOR LTE Band4)<br>824.7MHz ~ 848.3MHz (FOR LTE Band5)<br>699MHz ~ 716MHz (FOR LTE Band12)<br>704MHz ~ 716MHz (FOR LTE Band17) |
| | **NFC** | 13.56 MHz |
| **ANTENNA GAIN** | PIFA Antenna with 1dBi gain for Bluetooth/ BT_LE/ WIFI 2.4G<br>PIFA Antenna with 2dBi gain for WIFI 5G<br>Fixed External antenna with -1.5dBi gain for WCDMA Band 5 / LTE Band 5/ LTE Band 12/ LTE Band 17<br>Fixed External antenna with 0.5dBi gain for WCDMA Band 2 / LTE Band 2/ LTE Band 4 | |
| **HW VERSION** | E800-XXXXX-XXXX-XXX-XX | |
| **SW VERSION** | V0.0.0.1 | |
| **I/O PORTS** | Refer to user's manual | |

| CABLE SUPPLIED | N/A |
|---|---|

**NOTE**:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The EUT was powered by the following adapter:

| ADAPTER | |
|---|---|
| **BRAND:** | HOIOTO |
| **MODEL:** | ADS-65HI-19A-3 24065E |
| **INPUT:** | AC 100-240V, 1550mA |
| **OUTPUT:** | DC 24V, 2700mA |

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

# 3 RF EXPOSURE

## 3.1 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** | | | | |
| 300-1500 | … | … | F/1500 | 30 |
| 1500-100,000 | … | … | 1.0 | 30 |

F = Frequency in MHz

## 3.2 MPE CALCULATION FORMULA

Pd = (Pout*G) / (4*pi*r2)

where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

## 3.3 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**.

## 3.4 CONDUCTED POWER

### Bluetooth

### GFSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 0 | 2402 | 7.84 | N/A |
| 39 | 2441 | 8.19 | N/A |
| 78 | 2480 | **8.43** | N/A |

### π /4 DQPSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 0 | 2402 | 3.92 | N/A |
| 39 | 2441 | 4.40 | N/A |
| 78 | 2480 | 4.14 | N/A |

### 8DPSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 0 | 2402 | 4.02 | N/A |
| 39 | 2441 | 4.29 | N/A |
| 78 | 2480 | 4.14 | N/A |

### BT-LE (GFSK)

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 0 | 2402 | 3.73 | N/A |
| 19 | 2440 | 4.05 | N/A |
| 39 | 2480 | 3.69 | N/A |

## WIFI 2.4G

### 802.11b

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 1 | 2412 | 15.73 | N/A |
| 6 | 2437 | 15.77 | N/A |
| 11 | 2462 | **15.88** | N/A |

### 802.11g

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 1 | 2412 | 15.58 | N/A |
| 6 | 2437 | 15.73 | N/A |
| 11 | 2462 | 15.80 | N/A |

### 802.11n (20MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 1 | 2412 | 14.70 | N/A |
| 6 | 2437 | 14.68 | N/A |
| 11 | 2462 | 14.67 | N/A |

### 802.11n (40MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 3 | 2422 | 14.35 | N/A |
| 6 | 2437 | 14.49 | N/A |
| 9 | 2452 | 14.34 | N/A |

## WIFI 5G

### 802.11a

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 36 | 5180 | 8.86 | PASS |
| 40 | 5200 | 8.58 | PASS |
| 48 | 5240 | 8.22 | PASS |
| 52 | 5260 | 7.40 | PASS |
| 60 | 5300 | 7.25 | PASS |
| 64 | 5320 | 7.16 | PASS |
| 100 | 5500 | 8.53 | PASS |
| 116 | 5580 | 9.75 | PASS |
| 140 | 5700 | **9.89** | PASS |
| 149 | 5745 | **9.47** | PASS |
| 157 | 5785 | 8.22 | PASS |
| 165 | 5825 | 8.01 | PASS |

### 802.11n (20MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 36 | 5180 | 8.35 | PASS |
| 40 | 5200 | 8.37 | PASS |
| 48 | 5240 | 7.63 | PASS |
| 52 | 5260 | **7.49** | PASS |
| 60 | 5300 | 7.37 | PASS |
| 64 | 5320 | 7.02 | PASS |
| 100 | 5500 | 7.26 | PASS |
| 116 | 5580 | 8.77 | PASS |
| 140 | 5700 | 9.42 | PASS |
| 149 | 5745 | 8.52 | PASS |
| 157 | 5785 | 8.04 | PASS |
| 165 | 5825 | 7.57 | PASS |

### 802.11n (40MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER (dBm) | PASS/FAIL |
|---|---|---|---|
| 38 | 5190 | 7.52 | PASS |
| 46 | 5230 | 7.27 | PASS |
| 54 | 5270 | 6.29 | PASS |
| 62 | 5310 | 6.36 | PASS |
| 102 | 5510 | 7.67 | PASS |
| 110 | 5550 | 8.23 | PASS |
| 134 | 5670 | 9.38 | PASS |
| 151 | 5755 | 8.26 | PASS |
| 165 | 5825 | 7.33 | PASS |

### 802.11ac (80MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER w/o Duty Factor (dBm) | PASS/FAIL |
|---|---|---|---|
| 42 | 5210 | 7.45 | PASS |
| 58 | 5290 | 7.27 | PASS |
| 106 | 5530 | 7.41 | PASS |
| 155 | 5775 | 7.56 | PASS |

**NOTE: WWAN average power recorded in Report No.:SA160714W002.**

## 3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

### TUNE-UP POWER TABLE

| Band | Frequency (MHz) | Operating Mode | Tune-Up Power And Tolerance (dBm) |
|---|---|---|---|
| **Bluetooth** | 2480 | GFSK | 8.0 ± 0.5 |
| **WIFI 2.4G** | 2462 | 11b | 15.5 ± 0.5 |
| **WIFI 5G B1** | 5180 | 11a | 8.5 ± 0.5 |
| **WIFI 5G B2** | 5260 | 802.11n (20MHz) | 7.5 ± 0.5 |
| **WIFI 5G B3** | 5700 | 11a | 9.5 ± 0.5 |
| **WIFI 5G B4** | 5745 | 11a | 9.0 ± 0.5 |
| **WCDMA Band II** | 1852.4 | GPRS12 | 22.5 ± 0.5 |
| **WCDMA Band V** | 836.5 | GPRS12 | 23.0 ± 0.5 |
| **LTE Band 2** | 1880.0 | QPSK | 22.5 ± 0.5 |
| **LTE Band 4** | 1745.0 | QPSK | 21.5 ± 0.5 |
| **LTE Band 5** | 829.0 | QPSK | 23.0 ± 0.5 |
| **LTE Band 12** | 707.5 | QPSK | 23.0 ± 0.5 |
| **LTE Band 17** | 710.0 | QPSK | 22.5 ± 0.5 |

### BT & WIFI 2.4G & WIFI 5G

| Band | Frequency (MHz) | Operating Mode | Antenna Gain (dBi) | Tune-up Power (dBm) | E.I.R.P Power (mW) | Power Density (mW/cm^2) | limit (mW/cm^2) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|
| **Bluetooth** | 2480 | GFSK | 1 | 8.5 | 0.316 | 0.000 | 1.00 | PASS |
| **WIFI 2.4G** | 2462 | 11b | 1 | 16.0 | 50.119 | 0.010 | 1.00 | PASS |
| **WIFI 5G B1** | 5180 | 11a | 2 | 9.0 | 12.589 | 0.003 | 1.00 | PASS |
| **WIFI 5G B2** | 5260 | 802.11n (20MHz) | 2 | 10.0 | 15.849 | 0.003 | 1.00 | PASS |
| **WIFI 5G B3** | 5700 | 11a | 2 | 8.0 | 10.000 | 0.002 | 1.00 | PASS |
| **WIFI 5G B4** | 5745 | 11a | 2 | 9.5 | 14.125 | 0.003 | 1.00 | PASS |

**WCDMA**

| Band | Frequency (MHz) | Operating Mode | Antenna Gain (dBi) | Conducted Time Average Power (dBm) | E.I.R.P Power (mW) | Power Density (mW/cm^2) | limit (mW/cm^2) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|
| **WCDMA V** | 836.4 | GPRS12 | 3.5 | 23.05 | 451.856 | 0.090 | 2.60 | PASS |
| **WCDMA II** | 1852.4 | GPRS12 | 4.8 | 22.85 | 582.103 | 0.116 | 1.00 | PASS |

**LTE**

| Band | Frequency (MHz) | Operating Mode | Antenna Gain (dBi) | Conducted Time Average Power (dBm) | E.I.R.P Power (mW) | Power Density (mW/cm^2) | limit (mW/cm^2) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|
| **Band2** | 1880.0 | QPSK | 4.8 | 22.08 | 487.528 | 0.097 | 1.00 | PASS |
| **Band4** | 1745.0 | QPSK | 4.8 | 21.90 | 467.735 | 0.093 | 1.00 | PASS |
| **Band5** | 829.0 | QPSK | 3.5 | 23.18 | 465.586 | 0.093 | 2.59 | PASS |
| **Band12** | 707.5 | QPSK | 3.5 | 23.0 | 446.684 | 0.089 | 2.32 | PASS |
| **Band17** | 710.0 | QPSK | 3.5 | 22.5 | 398.107 | 0.079 | 2.33 | PASS |

## 3.6 CONCLUSION OF SIMULTANEOUS TRANSMITTER

Both of the WLAN and plug-in device can transmit simultaneously, the formula of calculated the MPE is:

CPD1/LPD1+CPD2/LPD2+……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is 0.000/1.00+0.010/1.00+0.003/1.00+0.003/1.00+0.002/1.00+0.003/1.00+0.090/2.60+0.116/1.00+0.097/1.00+0.093/2.59+0.089/2.32+0.079/2.33 =0.38, which is less than “1”, This confirmed that the device comply with FCC 1.1310 MPE limit.

**--END--**