# RF EXPOSURE REPORT

GLOBAL TESTING & CERTIFICATIONS
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**Report No.: 15070303-FCC-H2**

**Supersede Report No.: N/A**

| | |
|---|---|
| **Applicant** | SynCrown Inc. |
| **Product Name** | Mobile Thermal Printer |
| **Model No.** | SMP-M240 |
| **Test Standard** | FCC 2.1091 |
| **Test Date** | May 06, 2015 |
| **Issue Date** | May 08, 2015 |
| **Test Result** | ☑ Pass ☐ Fail |
| **Equipment complied with the specification** | ☑ |
| **Equipment did not comply with the specification** | ☐ |

| | | |
|---|---|---|
| Wiky Jam | Chris You | |
| **Wiky Jam**<br>**Test Engineer** | **Chris You**<br>**Checked By** | |

**This test report may be reproduced in full only**

**Test result presented in this test report is applicable to the tested sample only**


**Issued by:**

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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# Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.


In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

## Accreditations for Conformity Assessment

| Country/Region | Scope |
|---|---|
| USA | EMC, RF/Wireless, SAR, Telecom |
| Canada | EMC, RF/Wireless, SAR, Telecom |
| Taiwan | EMC, RF, Telecom, SAR, Safety |
| Hong Kong | RF/Wireless, SAR, Telecom |
| Australia | EMC, RF, Telecom, SAR, Safety |
| Korea | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan | EMI, RF/Wireless, SAR, Telecom |
| Singapore | EMC, RF, SAR, Telecom |
| Europe | EMC, RF, SAR, Telecom, Safety |

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# 1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|---|---|---|---|
| 15070303-FCC-H2 | NONE | Original | May 08, 2015 |
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# 2. Customer information

| | |
|---|---|
| Applicant Name | SynCrown Inc. |
| Applicant Add | 704, EnC dream-tower, 45 Gasan Digital 1st road, GeumCheon, Seoul, Korea |
| Manufacturer | Xiamen Hanin Electronic Technology Co., Ltd. |
| Manufacturer Add | Room 305A, Angye Building, Pioneering Park, Torch High-tech Zone, Xiamen China |

# 3. Test site information

| | |
|---|---|
| Lab performing tests | SIEMIC (Shenzhen-China) LABORATORIES |
| Lab Address | Zone A, Floor 1, Building 2 Wan Ye Long Technology Park<br>South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108 |
| FCC Test Site No. | 718246 |
| IC Test Site No. | 4842E-1 |
| Test Software | Radiated Emission Program-To Shenzhen v2.0 |

# 4. Equipment under Test (EUT) Information

| | |
|---|---|
| Description of EUT: | Mobile Thermal Printer |
| Main Model: | SMP-M240 |
| Serial Model: | N/A |
| Date EUT received: | April 28, 2015 |
| Antenna Gain: | Bluetooth/BLE: 2 dBi |
| Type of Modulation: | Bluetooth: GFSK, π /4DQPSK, 8DPSK<br>BLE: GFSK |
| RF Operating Frequency (ies): | Bluetooth: 2402-2480 MHz<br>BLE: 2402-2480 MHz |
| Number of Channels: | Bluetooth: 79CH<br>BLE: 40CH |
| Port: | USB Port, Power Port |
| Input Power: | Battery:<br>Model: L002<br>Spec: 7.4V 1500mAh<br>Adapter:<br>Model: P6120050 US<br>Input: AC 100-240V; 50/60Hz 0.2A<br>Output: DC 12.0V; 0.5A |
| Trade Name : | SYNCROWN |
| FCC ID: | 2AEPCSMP-M240 |

# 5. FCC §2.1091 - Radiofrequency radiation exposure evaluation

## 5.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission' s guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

| Limits for General Population/Uncontrolled Exposure | | | | |
|---|---|---|---|---|
| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density ($mW/cm^2$) | Averaging Time (minutes) |
| 0.3-1.34 | 614 | 1.63 | *(100) | 30 |
| 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

* = Plane-wave equivalent power density

## 5.2 Test Result

| Type | Test mode | CH | Freq (MHz) | Conducted Power (dBm) | Tune Up Power (dBm) |
|---|---|---|---|---|---|
| Bluetooth Output power | GFSK | Low | 2402 | -1.632 | -2±1 |
| | | Mid | 2441 | -2.044 | -2±1 |
| | | High | 2480 | -2.864 | -2±1 |
| | π /4 DQPSK | Low | 2402 | -1.529 | -2±1 |
| | | Mid | 2441 | -1.848 | -2±1 |
| | | High | 2480 | -2.693 | -2±1 |
| | 8-DPSK | Low | 2402 | -1.220 | -2±1 |
| | | Mid | 2441 | -1.653 | -2±1 |
| | | High | 2480 | -2.406 | -2±1 |
| | | | | | |
| BLE Output power | GFSK | Low | 2402 | -2.751 | -3±1 |
| | | Mid | 2441 | -3.102 | -3±1 |
| | | High | 2480 | -3.893 | -3±1 |

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm$^2$)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: -1.0 (dBm)

Maximum output power at antenna input terminal: 0.794 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2402 (MHz) low frequency

Antenna Gain (typical): 2 (dBi)

Antenna Gain (typical): 1.585 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.00025($mW/cm^2$)

MPE limit for general population exposure at prediction frequency: 1.0 ($mW/cm^2$)

0.00025($mW/cm^2$) < 1.0 ($mW/cm^2$)

**Result:** Pass