



## RF Exposure Evaluation Report

APPLICANT : Montage  
EQUIPMENT : Traxit X 2G GPS Tracker  
BRAND NAME : Montage Asia  
MODEL NAME : TXXL1G2  
FCC ID : N69-831000  
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

### **SPORTON INTERNATIONAL (SHENZHEN) INC.**

**No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C.**



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**Revision History**

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FA370804   | Rev. 01 | Initial issue of report | Aug. 06, 2013 |
|            |         |                         |               |
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**1. Administration Data****1.1. Testing Laboratory**

|                           |                                                                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL (SHENZHEN) INC.                                                                                                                          |
| <b>Test Site Location</b> | No. 101, Complex Building C, Guanlong Village, Xili Town,<br>Nanshan District, Shenzhen, Guangdong, P.R.C.<br>TEL: +86-755-8637-9589<br>FAX: +86-755-8637-9595 |

**1.2. Applicant**

|                     |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| <b>Company Name</b> | Montage                                                                                                |
| <b>Address</b>      | Flat J, 13/F, Tower C, NEO Enterprise Avenue, 6009 Shennan Mid Road,<br>Futian, Shenzhen, CHINA 518048 |

**1.3. Manufacturer**

|                     |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| <b>Company Name</b> | Montage                                                                                                |
| <b>Address</b>      | Flat J, 13/F, Tower C, NEO Enterprise Avenue, 6009 Shennan Mid Road,<br>Futian, Shenzhen, CHINA 518048 |



## **2. Description of Equipment Under Test (EUT)**

| Product Feature & Specification         |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------|
| EUT Type                                | Traxit X 2G GPS Tracker                                           |
| Brand Name                              | Montage Asia                                                      |
| Model Name                              | TXXL1G2                                                           |
| FCC ID                                  | N69-831000                                                        |
| Wireless Technology and Frequency Range | GSM850: 824.2 MHz ~ 848.8 MHz<br>GSM1900: 1850.2 MHz ~ 1909.8 MHz |
| Mode                                    | • GPRS                                                            |
| Antenna Type                            | Dipole Antenna                                                    |
| HW Version                              | IONX_V16                                                          |
| SW Version                              | M5216_V1.6.8                                                      |
| EUT Stage                               | Identical Prototype                                               |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

### 3. Maximum RF average output power among production units

| Maximum Target Burst Average Power for Production Unit |         |          |
|--------------------------------------------------------|---------|----------|
| Mode / Band                                            | GSM 850 | GSM 1900 |
| GPRS                                                   | 33      | 30.5     |

### 4. Conducted RF Output Power (Unit: dBm)

| Band: GSM850                  | Burst Average Power (dBm) |       |       | Frame-Average Power (dBm) |       |       |
|-------------------------------|---------------------------|-------|-------|---------------------------|-------|-------|
| Channel                       | 128                       | 189   | 251   | 128                       | 189   | 251   |
| Frequency (MHz)               | 824.2                     | 836.4 | 848.8 | 824.2                     | 836.4 | 848.8 |
| GPRS (GMSK, 1 Tx slot) – CS1  | 31.45                     | 31.39 | 31.37 | 22.45                     | 22.39 | 22.37 |
| GPRS (GMSK, 2 Tx slots) – CS1 | 31.07                     | 31.02 | 31.02 | 25.07                     | 25.02 | 25.02 |
| GPRS (GMSK, 4 Tx slots) – CS1 | 29.16                     | 29.14 | 29.08 | 26.16                     | 26.14 | 26.08 |

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.  
The calculated method are shown as below:  
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB  
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB  
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

| Band: GSM1900                 | Burst Average Power (dBm) |       |        | Frame-Average Power (dBm) |       |        |
|-------------------------------|---------------------------|-------|--------|---------------------------|-------|--------|
| Channel                       | 512                       | 661   | 810    | 512                       | 661   | 810    |
| Frequency (MHz)               | 1850.2                    | 1880  | 1909.8 | 1850.2                    | 1880  | 1909.8 |
| GPRS (GMSK, 1 Tx slot) – CS1  | 28.15                     | 28.38 | 28.60  | 19.15                     | 19.38 | 19.60  |
| GPRS (GMSK, 2 Tx slots) – CS1 | 27.87                     | 28.14 | 28.37  | 21.87                     | 22.14 | 22.37  |
| GPRS (GMSK, 4 Tx slots) – CS1 | 26.00                     | 26.29 | 26.53  | 23.00                     | 23.29 | 23.53  |

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.  
The calculated method are shown as below:  
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB  
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB  
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

## 5. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

| Frequency range (MHz)                                          | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3-3.0                                                        | 614                           | 1.63                          | *(100)                              | 6                        |
| 3.0-30                                                         | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | 6                        |
| 30-300                                                         | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1500                                                       |                               |                               | f/300                               | 6                        |
| 1500-100,000                                                   |                               |                               | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34                                                       | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34-30                                                        | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                       |
| 30-300                                                         | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1500                                                       |                               |                               | f/1500                              | 30                       |
| 1500-100,000                                                   |                               |                               | 1.0                                 | 30                       |

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



## **6. Radio Frequency Radiation Exposure Evaluation**

### **6.1. Standalone Power Density Calculations**

| Band      | Frequency (MHz) | Antenna Gain (dBi) | Maximum Power (dBm) | Average EIRP (mW) | Power Density at 20cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------|-----------------|--------------------|---------------------|-------------------|---------------------------------------------|-----------------------------|
| GPRS 850  | 824.2           | -1.0               | 33.0                | 199.53            | 0.04                                        | 0.55                        |
| GPRS 1900 | 1850.2          | 1.0                | 30.5                | 177.83            | 0.04                                        | 1.00                        |

**Note:** For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band

### **Conclusion:**

Per 47 CFR §2.1091, EUT source-based time-averaged ERP < 1.5W for RF operating frequency ≤ 1.5GHz, EUT source-based time-averaged EIRP < 3W for RF operating frequency > 1.5GHz, routine evaluation of MPE is not required; MPE calculation is sufficient to show compliance. The MPE calculation results indicate that the EUT complies with the RF exposure limit of ANSI/IEEE C95.1-1992.