

# RF Exposure Evaluation Report

APPLICANT : Gosafe Company Limited

EQUIPMENT : GPS tracker

BRAND NAME : GOSAFE

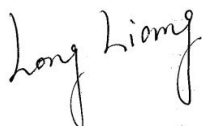
MODEL NAME : GAT1000

FCC ID : RSRP-RI-ME

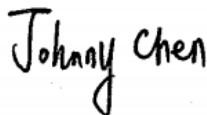
STANDARD : 47 CFR Part 2.1091

FCC KDB 447498 D01 v06

We, Sporton International (ShenZhen) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International (ShenZhen) Inc., the test report shall not be reproduced except in full.



Reviewed by: Long Liang / Supervisor



Approved by: Johnny Chen / Manager



**Sporton International (ShenZhen) Inc.**

**1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055**

**People's Republic of China**



## **Table of Contents**

|                                                                        |          |
|------------------------------------------------------------------------|----------|
| <b>1. ADMINISTRATION DATA .....</b>                                    | <b>4</b> |
| 1.1. Testing Laboratory .....                                          | 4        |
| <b>2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) .....</b>              | <b>5</b> |
| <b>3. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS .....</b> | <b>6</b> |
| <b>4. RF EXPOSURE LIMIT INTRODUCTION .....</b>                         | <b>7</b> |
| <b>5. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION .....</b>          | <b>8</b> |
| 5.1. Standalone Power Density Calculation .....                        | 8        |

**Revision History**

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FA9N1902   | Rev. 01 | Initial issue of report | Feb. 25, 2020 |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |
|            |         |                         |               |



## **1. Administration Data**

### **1.1. Testing Laboratory**

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

| Testing Laboratory |                                                                                                                                                                         |                                |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Test Firm          | Sporton International (Shenzhen) Inc.                                                                                                                                   |                                |
| Test Site Location | 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China<br>TEL: +86-755-86379589<br>FAX: +86-755-86379595 |                                |
| Test Site No.      | FCC Designation No.                                                                                                                                                     | FCC Test Firm Registration No. |
|                    | CN1256                                                                                                                                                                  | 421272                         |

| Applicant    |                                                                                         |
|--------------|-----------------------------------------------------------------------------------------|
| Company Name | Gosafe Company Limited                                                                  |
| Address      | RM 1105, the Innovation Building C1 No. 182 Kexue Avenue, Science City, Guangzhou.China |

| Manufacturer |                                                                                                                                          |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Company Name | DongGuan Smute Electronic & Technology co.,Ltd.                                                                                          |
| Address      | Huangzhou Industrial Park, Puxi Economic Joint Community, Huaqiang Road,Xincheng District, Shilong Town, Dongguan ,Guangdong, P.R. China |

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

| Product Feature & Specification                 |                                                                                                                                                                                                                                                                          |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT Type                                        | GPS tracker                                                                                                                                                                                                                                                              |
| Brand Name                                      | GOSAFE                                                                                                                                                                                                                                                                   |
| Model Name                                      | GAT1000                                                                                                                                                                                                                                                                  |
| FCC ID                                          | RSRP-RI-ME                                                                                                                                                                                                                                                               |
| Wireless Technology and Frequency Range         | WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz<br>WCDMA Band V: 826.4 MHz ~ 846.6 MHz<br>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4: 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5: 824.7 MHz ~ 848.3 MHz<br>LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>Bluetooth: 2402 MHz ~ 2480 MHz |
| Mode                                            | HSDPA<br>HSUPA<br>DC-HSDPA<br>HSPA+ (16QAM uplink is not supported)<br>LTE : QPSK / 16QAM<br>Bluetooth LE                                                                                                                                                                |
| Antenna Type                                    | PCB Antenna                                                                                                                                                                                                                                                              |
| HW Version                                      | V3.0.0                                                                                                                                                                                                                                                                   |
| SW Version                                      | V2.1.12                                                                                                                                                                                                                                                                  |
| EUT Stage                                       | Production Unit                                                                                                                                                                                                                                                          |
| <b>Remark:</b>                                  |                                                                                                                                                                                                                                                                          |
| 1. This device does not support voice function. |                                                                                                                                                                                                                                                                          |

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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

#### <WCDMA>

| Mode  |         | Maximum Average power(dBm) |
|-------|---------|----------------------------|
| WCDMA | Band II | 24.00                      |
|       | Band V  | 24.00                      |

#### <LTE>

| Mode        | Maximum Average power(dBm) |
|-------------|----------------------------|
| LTE Band 2  | 24.00                      |
| LTE Band 4  | 24.00                      |
| LTE Band 5  | 24.00                      |
| LTE Band 17 | 24.00                      |

#### <Bluetooth>

| Mode          | Maximum Average power(dBm) |
|---------------|----------------------------|
| Bluetooth BLE | 4.00                       |

#### 4. 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

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

### **5.1. Standalone Power Density Calculation**

| Band         | Frequency (MHz) | Antenna Gain (dBi) | Maximum Power (dBm) | Maximum EIRP (dBm) | Maximum EIRP (W) | Average EIRP (mW) | Power Density at 20cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Power Density / Limit |
|--------------|-----------------|--------------------|---------------------|--------------------|------------------|-------------------|---------------------------------------------|-----------------------------|-----------------------|
| WCDMA Band 2 | 1852.4          | 3.00               | 24.00               | 27.00              | 0.501            | 501.187           | 0.100                                       | 1.000                       | 0.100                 |
| WCDMA Band 5 | 826.4           | 3.00               | 24.00               | 27.00              | 0.501            | 501.187           | 0.100                                       | 0.551                       | 0.181                 |
| LTE Band 2   | 1850.7          | 3.00               | 24.00               | 27.00              | 0.501            | 501.187           | 0.100                                       | 1.000                       | 0.100                 |
| LTE Band 4   | 1710.7          | 3.00               | 24.00               | 27.00              | 0.501            | 501.187           | 0.100                                       | 1.000                       | 0.100                 |
| LTE Band 5   | 824.7           | 3.00               | 24.00               | 27.00              | 0.501            | 501.187           | 0.100                                       | 0.550                       | 0.181                 |
| LTE Band 17  | 706.5           | 3.00               | 24.00               | 27.00              | 0.501            | 501.187           | 0.100                                       | 0.471                       | <b>0.212</b>          |
| Bluetooth    | 2402.0          | 2.00               | 4.00                | 6.00               | 0.004            | 3.981             | 0.001                                       | 1.000                       | <b>0.001</b>          |

**Note:**

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band
2. Chose the maximum power to do MPE analysis.

**5.2. Collocated Power Density Calculation**

| Max WWAN<br>Power Density<br>/ Limit | Max Bluetooth<br>Power Density<br>/ Limit | $\Sigma$ (Power Density / Limit)<br>of<br>WWAN + Bluetooth |
|--------------------------------------|-------------------------------------------|------------------------------------------------------------|
| 0.212                                | 0.001                                     | 0.213                                                      |

**Note:**

1. For collocation analysis, LTE band 17 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2.  $\Sigma$ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + Bluetooth.
3. Considering the WWAN module collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

**Conclusion:**

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.