



RF Exposure Evaluation Report

APPLICANT : Sinocastel Co., Ltd.
EQUIPMENT : OBD GPS Tracker
BRAND NAME : OBD-Smart
MODEL NAME : IDD-213N
FCC ID : S8U213N
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.

1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town,
Nanshan District, Shenzhen, Guangdong, P. R. China



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Revision History

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|------------|---------|-------------------------|---------------|
| FA431904 | Rev. 01 | Initial issue of report | Jan. 08, 2015 |
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1. Administration Data

1.1. Testing Laboratory

| Testing Laboratory | |
|--------------------|---|
| Test Site | SPORTON INTERNATIONAL (SHENZHEN) INC. |
| Test Site Location | 1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 |

| Applicant | |
|--------------|---|
| Company Name | Sinocastel Co., Ltd. |
| Address | 5F, 5th Building, Software Park, No. 2 Gaoxin C. 3rd Road, Nanshan District, Shezhen, China |

| Manufacturer | |
|--------------|---|
| Company Name | Sinocastel Co., Ltd. |
| Address | 5F, 5th Building, Software Park, No. 2 Gaoxin C. 3rd Road, Nanshan District, Shezhen, China |



2. Description of Equipment Under Test (EUT)

| Product Feature & Specification | |
|---|--|
| EUT Type | OBD GPS Tracker |
| Brand Name | OBD-Smart |
| Model Name | IDD-213N |
| FCC ID | S8U213N |
| Wireless Technology and Frequency Range | GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz |
| Mode | <ul style="list-style-type: none">• GPRS/EGPRS• RMC 12.2Kbps• HSDPA• HSUPA |
| Antenna Type | WWAN: PIFA Antenna |
| HW Version | C |
| SW Version | V2.2.5 |
| 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

| Mode | GSM 850 | GSM 1900 |
|-------------------------|--------------------|----------|
| | Average power(dBm) | |
| GPRS (GMSK, 1 Tx slot) | 31.0 | 29.5 |
| GPRS (GMSK, 2 Tx slots) | 31.5 | 29.5 |
| EDGE (8PSK, 1 Tx slot) | 26.0 | 25.5 |
| EDGE (8PSK, 2 Tx slots) | 26.0 | 25.5 |

| Mode | WCDMA Band V | WCDMA Band II |
|-----------------|--------------------|---------------|
| | average power(dBm) | |
| RMC 12.2Kbps | 23.5 | 21.5 |
| HSDPA Subtest-1 | 23.5 | 21.5 |
| HSDPA Subtest-2 | 22.5 | 21.5 |
| HSDPA Subtest-3 | 22.5 | 21.0 |
| HSDPA Subtest-4 | 22.0 | 21.0 |
| HSUPA Subtest-1 | 22.5 | 21.0 |
| HSUPA Subtest-2 | 20.5 | 19.0 |
| HSUPA Subtest-3 | 21.5 | 20.5 |
| HSUPA Subtest-4 | 20.5 | 19.5 |
| HSUPA Subtest-5 | 22.5 | 21.5 |



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 ²) | Averaging time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposures | | | | |
| 0.3-3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0-30 | 1842/f | 4.89/f | *(900/f ²) | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | | | f/300 | 6 |
| 1500-100,000 | | | 5 | 6 |
| (B) Limits for General Population/Uncontrolled Exposure | | | | |
| 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 |

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 ²) | Limit (mW/cm ²) |
|-------------------------|-----------------|--------------------|---------------------|--------------------|------------------|-------------------|---|-----------------------------|
| GPRS 850 (1 Tx slot) | 824.2 | 0.86 | 31.0 | 31.86 | 1.53 | 193.20 | 0.04 | 0.55 |
| GPRS 850 (2 Tx slots) | 824.2 | 0.86 | 31.5 | 32.36 | 1.72 | 432.51 | 0.09 | 0.55 |
| EGPRS 850 (1 Tx slot) | 824.2 | 0.86 | 26.0 | 26.86 | 0.49 | 61.09 | 0.01 | 0.55 |
| EGPRS 850 (2 Tx slots) | 824.2 | 0.86 | 26.0 | 26.86 | 0.49 | 121.90 | 0.02 | 0.55 |
| GPRS 1900 (1 Tx slot) | 1850.2 | 1.32 | 29.5 | 30.82 | 1.21 | 152.05 | 0.03 | 1.00 |
| GPRS 1900 (2 Tx slots) | 1850.2 | 1.32 | 29.5 | 30.82 | 1.21 | 303.39 | 0.06 | 1.00 |
| EGPRS 1900 (1 Tx slot) | 1850.2 | 1.32 | 25.5 | 26.82 | 0.48 | 60.53 | 0.01 | 1.00 |
| EGPRS 1900 (2 Tx slots) | 1850.2 | 1.32 | 25.5 | 26.82 | 0.48 | 120.78 | 0.02 | 1.00 |
| WCDMA Band V | 826.4 | 0.86 | 23.5 | 24.36 | 0.27 | 272.90 | 0.05 | 0.55 |
| WCDMA Band II | 1852.4 | 1.32 | 21.5 | 22.82 | 0.19 | 191.43 | 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:

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