Variant RF Exposure Evaluation Report

APPLICANT	**: Universal Scientific Industrial Co., Ltd.**
EQUIPMENT	**: UNA_850**
BRAND NAME	**: Universal Global Scientific Industrial Co., Ltd.**
MODEL NAME / MARKETING NAME	**: UNA_850**
FCC ID	**: IXM-UNA850**
FILING TYPE	**: Certification**
STANDARD	**: OET Bulletin 65 Supplement C (Edition 01-01)**

This is a variant report which is only valid together with the original test report. We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with FCC OET Bulletin 65 Supplement C (Edition 01-01), and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA231721-03	Rev. 01	This is a variant report which can be referred to Product Equality Declaration as Appendix A. Since the device variant part does not influence the test results, therefore, all the test cases were performed in original report which can be referred to Sporton Report No. FA231721-01 as appendix B.	Nov. 19, 2012

1. RF Exposure Introduction

Requirements

Three different categories of transmitters are defined by the FCC in OET Bulletin 65. These categories are fixed installation, mobile and portable and are defined as follows:

▪ **Fixed installation:**

Fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans form the antenna is maintained to at least 2 meters.

▪ **Mobile Devices:**

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitters's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR 2.1091.

▪ **Portable Devices:**

A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR 2.1093)

The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/Controlled Exposure and General Population/Uncontrolled Exposure. These two categories are defined as follows:

▪ **Occupational/controlled Exposure:**

In general, occupational/controlled exposure limits are applicable to situation in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.

▪ **General Population/Uncontrolled Exposure:**

The general population / uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category and the general population/uncontrolled exposure limits apply to these devices.

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

2.2 Applicant

Company Name	Universal Scientific Industrial Co., Ltd.
Address	141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

2.3 Manufacturer

Company Name	Universal Scientific Industrial Co., Ltd.
Address	141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

3. General Information

3.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type	UNA_850
Brand Name	Universal Global Scientific Industrial Co., Ltd.
Model Name / Marketing Name	UNA_850
FCC ID	IXM-UNA850
Tx Frequency	GSM850 : 824.2 MHz ~ 848.8 MHz GSM1900 : 1850.2 MHz ~ 1909.8 MHz WCDMA Band V : 826.4 MHz ~ 846.6 MHz
Rx Frequency	GSM850 : 869.2 MHz ~ 893.8 MHz GSM1900 : 1930.2 MHz ~ 1989.8 MHz WCDMA Band V : 871.4 MHz ~ 891.6 MHz
HW Version	V2.3
SW Version	V3.1a
Type of Modulation	GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)
DUT Stage	Identical Prototype

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

Appendix A. Product Equality Declaration

The plots are shown as follows.

Universal Scientific Industrial Co., Ltd.

141, Lane 351, Sec. 1, Taiping Road, Tsaotueng, Nantou 54261 Taiwan
Tel: 886-49-2350876 ; Fax: 886-49-2332061

Date: November 12, 2012

Product Equality Declaration

To whom it may concern,

Please be notified that we, Universal Scientific Industrial Co., Ltd., have assigned **Sporton International Inc.**, located at No. 52, Hwa Ya 1st Rd ., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C., as our agent.

Any and all acts carried out by **Sporton International Inc.,** on the matters of UNA_850 TCF Filing, shall have the same legal authority as acts on our own behalf.

Parent Model of as following:
Brand Name: Universal Global Scientific Industrial Co., Ltd
Model Name: UNA_850
HW Version: V2.3
SW Version: V3.1a
Valiant Model of as following:
Brand Name: Universal Global Scientific Industrial Co., Ltd
Model Name: UNA_850
HW Version: V2.3
SW Version: V3.1a

Declaration of Hardware Equality in tested devices of above two models:

1. **HW version change**
   UNA module and EVB are the same as those in parent model.
2. **SW version change**
   Using the same SW version V3.1a as that of parent model.
3. **Module package change:**
   Changing module package to CPS(component shielding) to replace metal can.

If you have any acknowledgement and response, please send it to **Sporton International Inc**. directly.

Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,

Henry Cheng

Contact Person: Henry Cheng
Applicant: 2G/3G modem
E-Mail: henry_cheng@ms.usi.com.tw

Appendix B. Original Report

Please refer to Sporton report number FA231721-01 as below.

RF Exposure Evaluation Report

APPLICANT	**: Universal Scientific Industrial Co., Ltd.**
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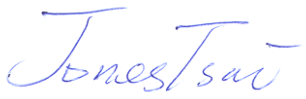
Reviewed by:



Jones Tsai / Manager

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA231721-01	Rev. 01	Initial issue of report	Sep. 26, 2012

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DUT Stage	Identical Prototype

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

4. RF Exposure Evaluation

4.1 Radio Frequency Radiation Exposure Evaluation

According to 1.1310 of the FCC rules, the power density limit for General Population/Uncontrolled Exposure is f/1500 mW/cm^2 for 300 MHz to 1500 MHz and 1.0 mW/cm^2 for 1500 MHz to 100000 MHz. As this is a mobile application the MPE shall be 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

This device is evaluated by mobile device with general population/uncontrolled exposure condition.

For this device, the calculation is as follows:

Operated in GSM or GPRS Multi-slot Class 8 for Cellular/PCS Band:

Function	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Average Power (dBm)	Maximum Average Power (mW)	Average EIRP (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
GSM Cellular Band	2	1.58	31.94	1563.15	309.68	0.06	0.55
GSM PCS Band	2	1.58	28.15	653.13	129.39	0.03	1.00

Operated in GPRS Multi-slot Class 10 for Cellular/PCS Band:

Function	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Average Power (dBm)	Maximum Average Power (mW)	Average EIRP (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
GSM Cellular Band	2	1.58	31.21	1321.30	523.53	0.10	0.55
GSM PCS Band	2	1.58	27.49	561.05	222.30	0.04	1.00

Operated in GPRS Multi-slot Class 12 for Cellular/PCS Band:

Function	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Average Power (dBm)	Maximum Average Power (mW)	Average EIRP (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
GSM Cellular Band	2	1.58	28.45	699.84	554.59	0.11	0.55
GSM PCS Band	2	1.58	24.76	299.23	237.12	0.05	1.00

Operated in WCDMA Cellular/PCS Band:

Function	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Output Power (dBm)	Maximum Output Power (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
WCDMA Cellular Band	2	1.58	23.19	208.45	0.07	0.55

This device can pass RF exposure limit.