



Variant FCC RF Test Report

APPLICANT : Universal Scientific Industrial Co., Ltd.
EQUIPMENT : UNA_900
BRAND NAME : Universal Global Scientific Industrial Co., Ltd.
MODEL NAME : UNA_900
MARKETING NAME : UNA_900
FCC ID : IXM-UNA900
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

This is a variant report which is only valid together with the original test report. The product was received on Mar. 17, 2012 and completely tested on Sep. 25, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

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.



TABLE OF CONTENTS

| | |
|---|-----------|
| REVISION HISTORY..... | 3 |
| SUMMARY OF TEST RESULT | 4 |
| 1 GENERAL DESCRIPTION..... | 5 |
| 1.1 Applicant..... | 5 |
| 1.2 Manufacturer | 5 |
| 1.3 Feature of Equipment Under Test..... | 5 |
| 1.4 Testing Site..... | 6 |
| 1.5 Applied Standards | 6 |
| 1.6 Ancillary Equipment List | 6 |
| 2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST..... | 7 |
| 2.1 Test Mode..... | 7 |
| 2.2 Connection Diagram of Test System | 8 |
| 3 TEST RESULT..... | 9 |
| 3.1 Field Strength of Spurious Radiation Measurement | 9 |
| 4 LIST OF MEASURING EQUIPMENT | 16 |
| 5 UNCERTAINTY OF EVALUATION..... | 17 |

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS

APPENDIX C. PRODUCT EQUALITY DECLARATION

APPENDIX D. ORIGIANL REPORT



REVISION HISTORY



SUMMARY OF TEST RESULT

| Report Section | FCC Rule | IC Rule | Description | Limit | Result | Remark |
|----------------|-------------------------------------|------------------------------------|--------------------------------------|--|--------|--|
| 3.1 | §2.1053 §22.917(a) §24.238(a) | RSS-132 (4.5.1) RSS-133 (6.5.1) | Field Strength of Spurious Radiation | $< 43 + 10 \log_{10}(P[\text{Watts}])$ | PASS | Under limit 22.42 dB at 5636.000 MHz |



1 General Description

1.1 Applicant

Universal Scientific Industrial Co., Ltd.

141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

1.2 Manufacturer

Universal Scientific Industrial Co., Ltd.

141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

1.3 Feature of Equipment Under Test

| Product Feature | |
|--|--|
| Equipment | UNA_900 |
| Brand Name | Universal Global Scientific Industrial Co., Ltd. |
| Model Name | UNA_900 |
| Marketing Name | UNA_900 |
| FCC ID | IXM-UNA900 |
| EUT supports Radios application | GSM/EGPRS/WCDMA/HSPA |
| HW Version | V2.3 |
| SW Version | V3.1a |
| 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.

| Product Specification subjective to this standard | |
|---|---|
| Tx Frequency | GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz |
| Rx Frequency | GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz |
| Maximum Output Power to Antenna | GSM850 : 32.09 dBm GSM1900 : 28.53 dBm |
| Type of Modulation | GSM: GMSK GPRS: GMSK EDGE: 8PSK |



1.4 Testing Site

| | | |
|---------------------------|---|--------------------------------|
| Test Site | SPORTON INTERNATIONAL INC. | |
| Test Site Location | No. 52, Hwa Ya 1 st 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 | |
| Test Site No. | Sporton Site No. | FCC/IC Registration No. |
| | 03CH06-HY | 722060/4086B-1 |

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- IC RSS-132 Issue 2
- IC RSS-133 Issue 5

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.6 Ancillary Equipment List

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|------|------------------|------------|----------------|---------|------------|--|
| 1. | System Simulator | R&S | CMU200 | N/A | N/A | Unshielded, 1.8 m |
| 2. | DC Power Supply | GW | GPC-60300 | N/A | N/A | Unshielded, 1.8 m |
| 3. | Notebook | DELL | Latitude E6320 | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |



2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850
2. 30 MHz to 19000 MHz for GSM1900

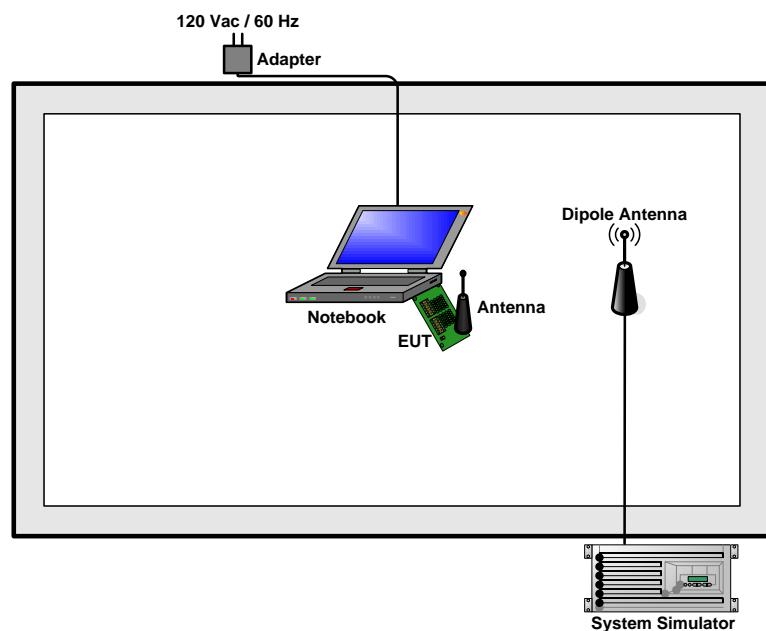
| Test Modes | |
|-----------------|--------------|
| Band | Radiated TCs |
| GSM 850 | ■ GSM Link |
| GSM 1900 | ■ GSMLink |

Note: The maximum power levels are GSM mode for GMSK link and EDGE multi-slot class 8 mode for 8PSK link, only these modes were used for all tests.

The conducted power tables are as follows:

| Conducted Power (*Unit: dBm) | | | | | | |
|------------------------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Band | GSM850 | | | GSM1900 | | |
| Channel | 128 | 189 | 251 | 512 | 661 | 810 |
| Frequency | 824.2 | 836.4 | 848.8 | 1850.2 | 1880.0 | 1909.8 |
| GSM | 32.04 | 32.07 | 32.09 | 28.50 | 28.53 | 27.90 |
| GPRS 8 | 32.02 | 32.05 | 32.07 | 27.99 | 27.98 | 27.88 |
| GPRS 10 | 31.34 | 31.42 | 31.41 | 27.25 | 27.27 | 27.19 |
| GPRS 12 | 28.73 | 28.52 | 28.42 | 24.61 | 24.49 | 24.44 |
| EGPRS 8 | 25.85 | 25.83 | 25.79 | 23.87 | 23.77 | 23.62 |
| EGPRS 10 | 24.74 | 24.72 | 24.69 | 22.85 | 22.78 | 22.62 |
| EGPRS 12 | 21.65 | 21.64 | 21.63 | 20.71 | 20.64 | 20.50 |

2.2 Connection Diagram of Test System





3 Test Result

3.1 Field Strength of Spurious Radiation Measurement

3.1.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.1.2 Measuring Instruments

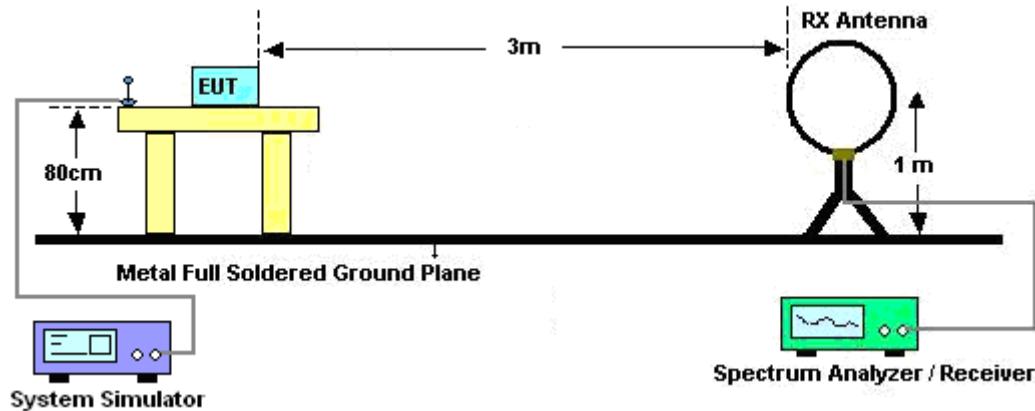
See list of measuring instruments of this test report.

3.1.3 Test Procedures

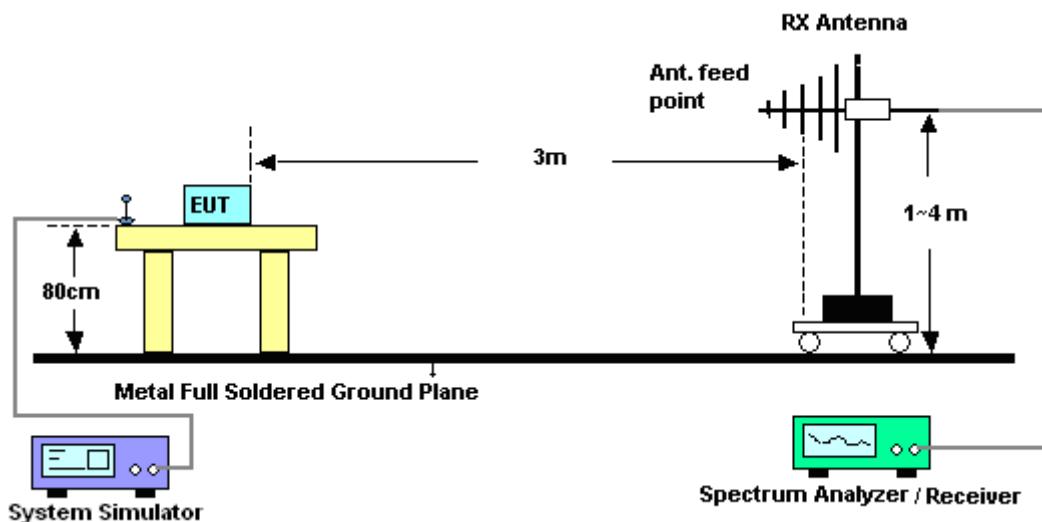
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15

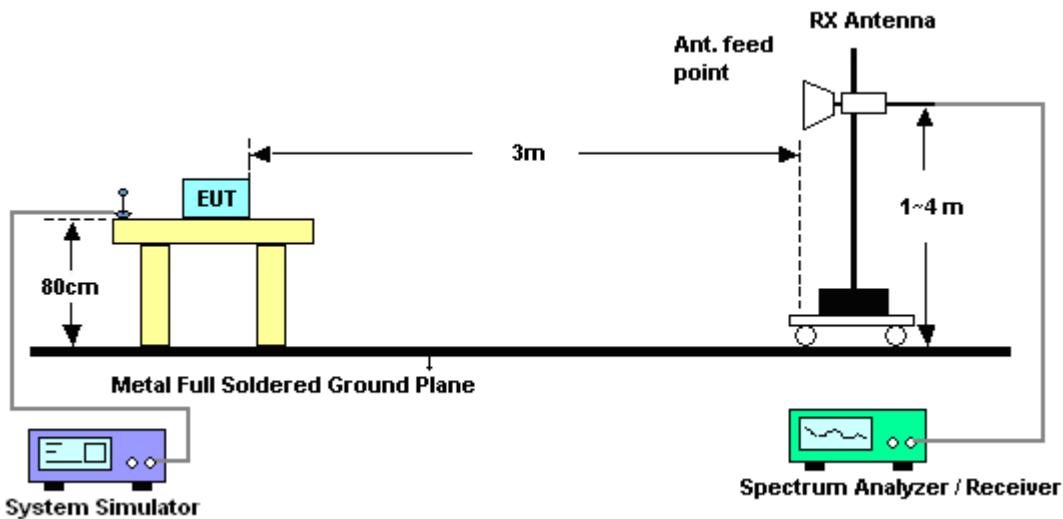
3.1.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz**3.1.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)**

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

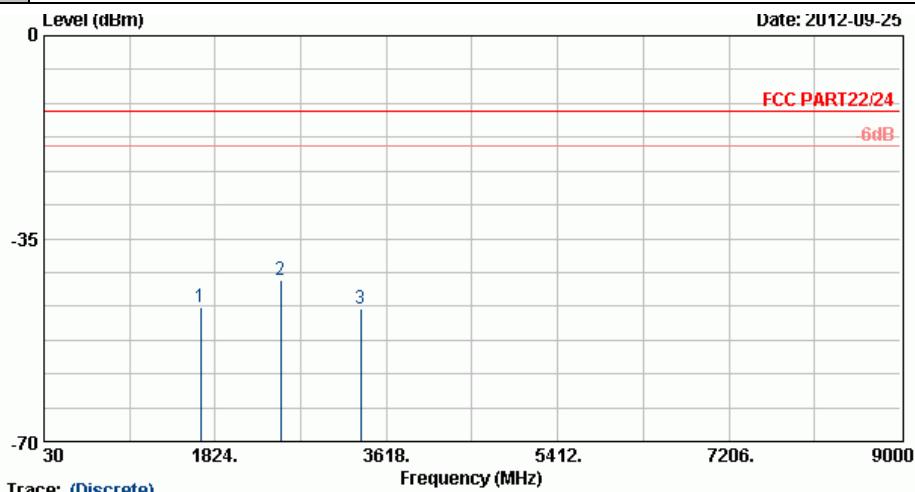


3.1.6 Test Result of Field Strength of Spurious Radiated

| Band : | GSM850 | | Temperature : | 27~28°C | | | | | |
|--|--|-------|---------------------|-------------|------------|---------------|-----------------|--------------|--------|
| Test Mode : | GSM Link | | Relative Humidity : | 45~46% | | | | | |
| Test Engineer : | Kai Wang | | Polarization : | Horizontal | | | | | |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | | | | | | | |
| <p>Level (dBm)</p> <p>Date: 2012-09-25</p> <p>FCC PART22/24</p> <p>6dB</p> <p>Frequency (MHz)</p> <p>Trace: (Discrete)</p> <p>Site : 03CH06-HV Condition : FCC PART22/24 EIRP_I00524 HORIZONTAL Power : DC 3.6V Project : FG 231721-02</p> | | | | | | | | | |
| Frequency | ERP | Limit | Over Limit | SPA Reading | S.G. Power | TX Cable loss | TX Antenna Gain | Polarization | Result |
| 1672 | -45.56 | -13 | -32.56 | -56.23 | -47.02 | 1.88 | 5.49 | H | Pass |
| 2506 | -39.35 | -13 | -26.35 | -51.90 | -40.98 | 2.44 | 6.22 | H | Pass |
| 3346 | -45.10 | -13 | -32.1 | -61.09 | -48.55 | 2.47 | 8.07 | H | Pass |



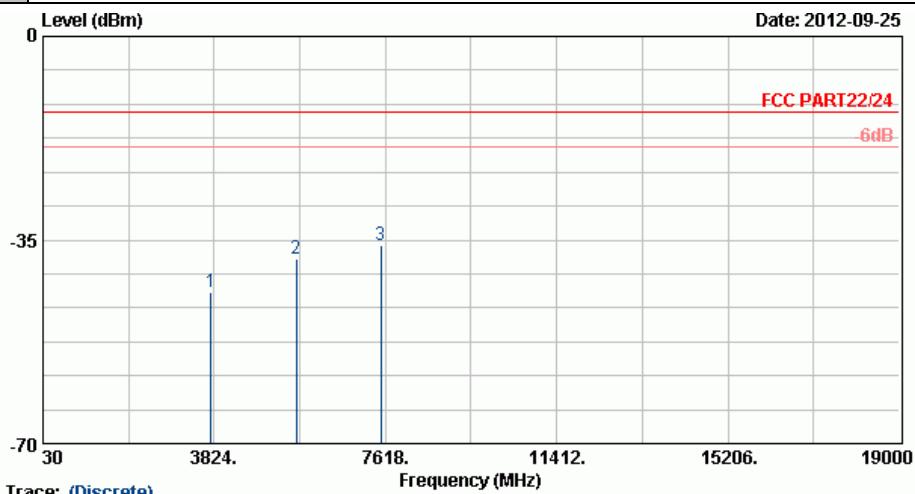
| | | | |
|-----------------|--|---------------------|----------|
| Band : | GSM850 | Temperature : | 27~28°C |
| Test Mode : | GSM Link | Relative Humidity : | 45~46% |
| Test Engineer : | Kai Wang | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



| Frequency | ERP | Limit | Over Limit | SPA | S.G. | TX Cable | TX Antenna | Polarization | Result |
|-----------|---------|---------|------------|---------|--------|----------|------------|--------------|--------|
| (MHz) | (dBm) | (dBm) | (dB) | Reading | Power | loss | Gain | (H/V) | |
| 1672 | -46.80 | -13 | -33.8 | -57.52 | -48.26 | 1.88 | 5.49 | V | Pass |
| 2506 | -42.12 | -13 | -29.12 | -54.69 | -43.75 | 2.44 | 6.22 | V | Pass |
| 3345 | -46.98 | -13 | -33.98 | -63.06 | -50.43 | 2.47 | 8.07 | V | Pass |



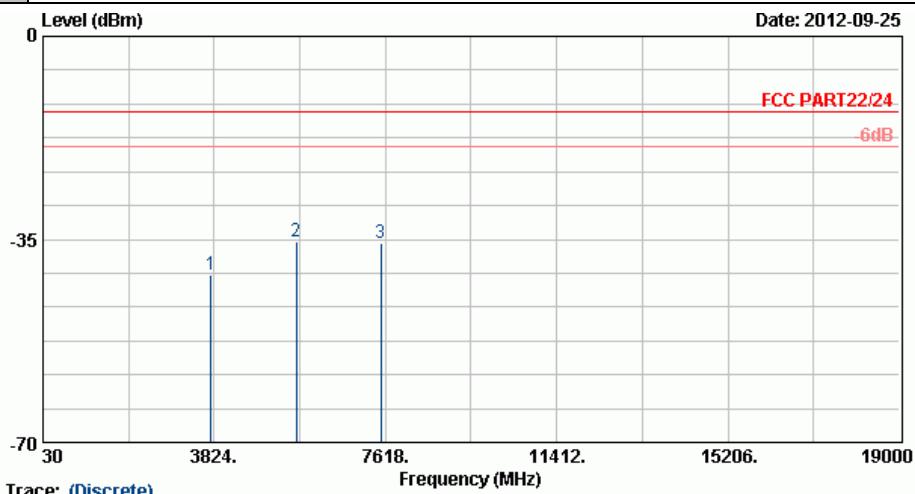
| | | | |
|-----------------|--|---------------------|------------|
| Band : | GSM1900 | Temperature : | 27~28°C |
| Test Mode : | GSM Link | Relative Humidity : | 45~46% |
| Test Engineer : | Kai Wang | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA (dBm) | S.G. (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|----------------------|-----------------|------------------|-------------------------|----------------|-----------------|----------------------------|-------------------------------|-------------------------|--------|
| 3756 | -43.95 | -13 | -30.95 | -61.66 | -50.20 | 2.56 | 8.81 | H | Pass |
| 5636 | -38.29 | -13 | -25.29 | -61.31 | -46.03 | 2.96 | 10.70 | H | Pass |
| 7520 | -35.86 | -13 | -22.86 | -63.05 | -44.76 | 3.22 | 12.12 | H | Pass |



| | | | |
|-----------------|--|---------------------|----------|
| Band : | GSM1900 | Temperature : | 27~28°C |
| Test Mode : | GSM Link | Relative Humidity : | 45~46% |
| Test Engineer : | Kai Wang | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA (dBm) | S.G. (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|-----------------|------------|-------------|-----------------|-----------|------------|--------------------|-----------------------|--------------------|--------|
| 3756 | -41.10 | -13 | -28.10 | -58.83 | -47.35 | 2.56 | 8.81 | V | Pass |
| 5636 | -35.42 | -13 | -22.42 | -58.46 | -43.16 | 2.96 | 10.70 | V | Pass |
| 7520 | -35.74 | -13 | -22.74 | -62.74 | -44.64 | 3.22 | 12.12 | V | Pass |



4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---------------------------|--------------|-----------------------|--------------|-----------------|------------------|---------------|---------------|-----------------------|
| Spectrum Analyzer | Agilent | E4408B | MY44211030 | 9KHz ~ 26.5GHz | Nov. 23, 2011 | Sep. 25, 2012 | Nov. 22, 2012 | Radiation (03CH06-HY) |
| Spectrum Analyzer | R&S | FSP30 | 101352 | 9KHz-30GHz | Nov. 03, 2011 | Sep. 25, 2012 | Nov. 02, 2012 | Radiation (03CH06-HY) |
| EMI Test Receiver | R&S | ESVS10 | 834468/003 | 20MHz ~ 1000MHz | May 04, 2012 | Sep. 25, 2012 | May. 03, 2013 | Radiation (03CH06-HY) |
| Bilog Antenna | SCHAFFNER | CBL6112B | 2885 | 30MHz ~ 2GHz | Oct. 22, 2011 | Sep. 25, 2012 | Oct. 21, 2012 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | EMCO | 3117 | 00066583 | 1GHz ~ 18GHz | Aug. 01, 2012 | Sep. 25, 2012 | Jul. 31, 2013 | Radiation (03CH06-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA917025 1 | 15GHz ~ 40GHz | Oct. 20, 2011 | Sep. 25, 2012 | Oct. 19, 2012 | Radiation (03CH06-HY) |
| Preamplifier | Agilent | 8449B | 3008A01917 | 1GHz ~ 26.5GHz | Apr. 13, 2012 | Sep. 25, 2012 | Apr. 12, 2013 | Radiation (03CH06-HY) |
| Amplifier | Agilent | 310N | 186713 | 9KHz ~ 1GHz | Apr. 11, 2012 | Sep. 25, 2012 | Apr. 10, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier | EMCI | EMC051845 | SN980048 | 1GHz ~ 18GHz | Jul. 21, 2012 | Sep. 25, 2012 | Jul. 20, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier | MITEQ | AMF-7D-00 101800-30-1 | 159087 | 1GHz~18GHz | Feb. 27, 2012 | Sep. 25, 2012 | Feb. 26, 2013 | Radiation (03CH06-HY) |
| Loop Antenna | R&S | HFH2-Z2 | 860004/001 | 9KHz ~ 30MHz | Jul. 03, 2012 | Sep. 25, 2012 | Jul. 02, 2014 | Radiation (03CH06-HY) |
| System Simulator | R&S | CMU200 | 117997 | N/A | Aug. 22, 2011 | Sep. 25, 2012 | Aug. 21, 2013 | Radiation (03CH06-HY) |



5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

| | |
|--|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2U _c (y)) | 2.54 |
|--|------|

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

| | |
|--|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2U _c (y)) | 4.72 |
|--|------|



Appendix A. Photographs of EUT

Please refer to Sporton report number EP231721-02 as below.



Appendix C. Product Equality Declaration

Universal Scientific Industrial Co., Ltd.

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

Date: September 28, 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_900

HW Version: V2.1

SW Version: MAUI.11A.W11.12.MP.V67.F1

Valiant Model of as following:

Brand Name: Universal Global Scientific Industrial Co., Ltd

Model Name: UNA_900

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 is the same and it only change to EVB circuit.

EVB change item:

- a. add ESD parts on SIM card signal.
- b. change pin define (J51 and J52).
- c. change audio codec package.

2. SW version change

The major changes in V3.1a are:

- 1) To shift the block address of NVRAM data in MCP. (For preventing the data overlap caused by bad block of MCP.)



2) Add an AT command to switch UNA USB mode (AT+UMSW)

These modifications have no change on RF & protocol features compared with parent model of UNA_900.

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 D. Original Report

Please refer to Sporton report number FG231721 as below.