



# FCC RADIO TEST REPORT

FCC ID : B32C6803GBTWN  
Equipment : Point of Sales Terminal  
Brand Name : Verifone  
Model Name : C680 3G-BT-WiFi  
Applicant : Verifone, Inc.  
1400 West Stanford Ranch Road, Suite 200,  
Rocklin CA 95765 USA  
Manufacturer : Verifone, Inc.  
Standard : FCC 47 CFR Part 2, 22(H), 24(E)

The product was received on Jan. 20, 2020 and testing was started from Aug. 14, 2020 and completed on Aug. 27, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

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

*Louis Wu*

Approved by: Louis Wu

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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### History of this test report

| Report No.  | Version | Description             | Issued Date   |
|-------------|---------|-------------------------|---------------|
| FG692114-08 | 01      | Initial issue of report | Aug. 27, 2020 |
|             |         |                         |               |
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|             |         |                         |               |



### Summary of Test Result

| Report Clause | Ref Std. Clause                       | Test Items   | Result (PASS/FAIL) | Remark                                     |
|---------------|---------------------------------------|--|--------------------|--|
| 3.2           | §2.1046                               | Conducted Output Power   | Pass               | -  |
|               | §22.913 (a)(2)                        | Effective Radiated Power (GSM850) (WCDMA Band V)                                       |                    |  |
|               | §24.232 (c)                           | Equivalent Isotropic Radiated Power (GSM1900) (WCDMA Band II)                          |                    |  |
| -             | §24.232 (d)                           | Peak-to-Average Ratio  | Not Required       |  |
| -             | §2.1049<br>§22.917 (b)<br>§24.238 (b) | Occupied Bandwidth (GSM850) (WCDMA Band V) (GSM1900) (WCDMA Band II)                   | Not Required       | -  |
| -             | §2.1051<br>§22.917 (a)<br>§24.238 (a) | Band Edge Measurement (GSM850) (WCDMA Band V) (GSM1900) (WCDMA Band II)                | Not Required       | -  |
| -             | §2.1051<br>§22.917 (a)<br>§24.238 (a) | Conducted Emission (GSM850) (WCDMA Band V) (GSM1900) (WCDMA Band II)                   | Not Required       | -  |
| -             | §2.1055<br>§22.355<br>§24.235         | Frequency Stability<br>Temperature & Voltage   | Not Required       | -  |
| 4.4           | §2.1053<br>§22.917 (a)<br>§24.238 (a) | Field Strength of Spurious Radiation (GSM850) (WCDMA Band V) (GSM1900) (WCDMA Band II) | Pass               | Under limit<br>14.82 dB at<br>2544.000 MHz |

**Remark:**

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report by revising WLAN Antenna and source. All the test cases were performed on original report which can be referred to Sporton Report Number FG692114-05 as appendix D. Based on the original report, the test cases were verified.

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**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.

Reviewed by: Wii Chang

Report Producer: Celery Wei



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

GSM/WCDMA, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n, and RFID.

| Product Specification subjective to this standard |  |
|---|--|
| Antenna Type                                      | WWAN: PCB Antenna<br>WLAN: PIFA Antenna<br>Bluetooth: PIFA Antenna<br>RFID: Bobbin Antenna |

| Specification of Accessory |              |  |
|----------------------------|--------------|--|
| AC Adapter                 | Brand Name   | Verifone, Inc.   |
|                            | Manufacturer | PHIHONG  |
|                            | Model Name   | AM11A-050A   |
|                            | Power Rating | Input : 100-240 V AC 50/60Hz, 0.5A<br>Output: 5.0V DC 2.2A |
|                            | Power Cord   | 1.8 meter, non-shielded cable, without ferrite core        |
| Battery                    | Brand Name   | Verifone, Inc.   |
|                            | Model Name   | BPK260-001   |

## 1.2 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.3 Testing Location

|                    |   |            |
|--------------------|---|------------|
| Test Site          | SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory   |            |
| Test Site Location | No.52, Huaya 1st Rd., Guishan Dist.,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |            |
| Test Site No.      | <b>Sporton Site No.</b>   |            |
|                    | TH03-HY   | 03CH07-HY  |
| Test Engineer      | Louis Chung   | Ken Wu     |
| Temperature        | 21 ~ 24 °C  | 23 ~ 25 °C |
| Relative Humidity  | 51 ~ 55 %   | 53 ~ 56 %  |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190



## **1.4 Applicable Standards**

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

**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.
3. The TAF code is not including all the FCC KDB listed without accreditation.



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane for Cellular Band; Z plane for PCS Band) were recorded in this report.

Radiated emissions were investigated as following frequency range:

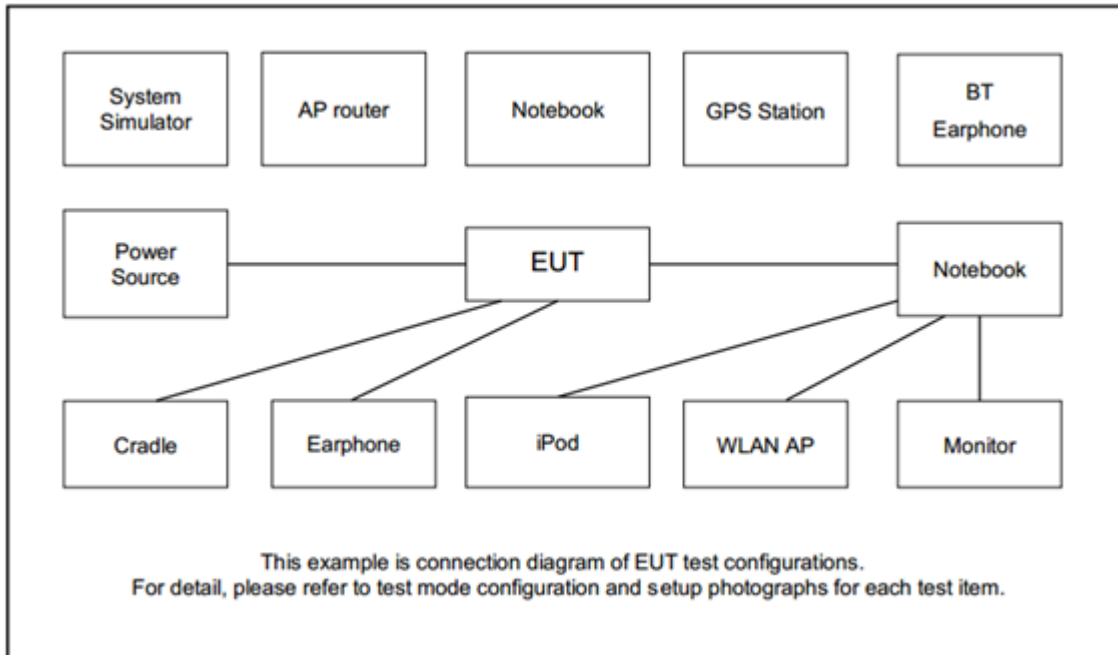
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V
2. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

| Test Modes    |   |   |
|---------------|---|---|
| Band          | Radiated TCs  | Conducted TCs   |
| GSM850        | <ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul> | <ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul> |
| GSM1900       | <ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul> | <ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul> |
| WCDMA Band V  | <ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>                             | <ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>                             |
| WCDMA Band II | <ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>                             | <ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>                             |

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration

| Item | Equipment        | Brand Name | Model No. | FCC ID | Data Cable | Power Cord        |
|------|------------------|------------|-----------|--------|------------|-------------------|
| 1.   | System Simulator | R&S        | CMU 200   | N/A    | N/A        | Unshielded, 1.8 m |

## 2.4 Frequency List of Low/Middle/High Channels

| Frequency List |                        |        |        |         |
|----------------|------------------------|--------|--------|---------|
| Band           | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| GSM850         | Channel                | 128    | 189    | 251     |
|                | Frequency              | 824.2  | 836.4  | 848.8   |
| WCDMA Band V   | Channel                | 4132   | 4182   | 4233    |
|                | Frequency              | 826.4  | 836.4  | 846.6   |
| GSM1900        | Channel                | 512    | 661    | 810     |
|                | Frequency              | 1850.2 | 1880.0 | 1909.8  |
| WCDMA Band II  | Channel                | 9262   | 9400   | 9538    |
|                | Frequency              | 1852.4 | 1880.0 | 1907.6  |



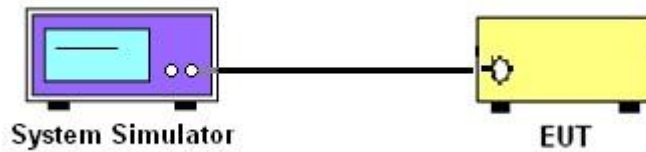
### 3 Conducted Test Result

#### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.1 Test Setup

##### 3.1.2 Conducted Output Power



##### 3.1.3 Test Result of Conducted Test

Please refer to Appendix A.



## 3.2 Conducted Output Power and ERP/EIRP

### 3.2.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$ ,  $ERP = EIRP - 2.15$ , where

$P_T$  = transmitter output power in dBm

$G_T$  = gain of the transmitting antenna in dBi

$L_C$  = signal attenuation in the connecting cable between the transmitter and antenna in dB

### 3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

## 4 Radiated Test Items

### 4.1 Measuring Instruments

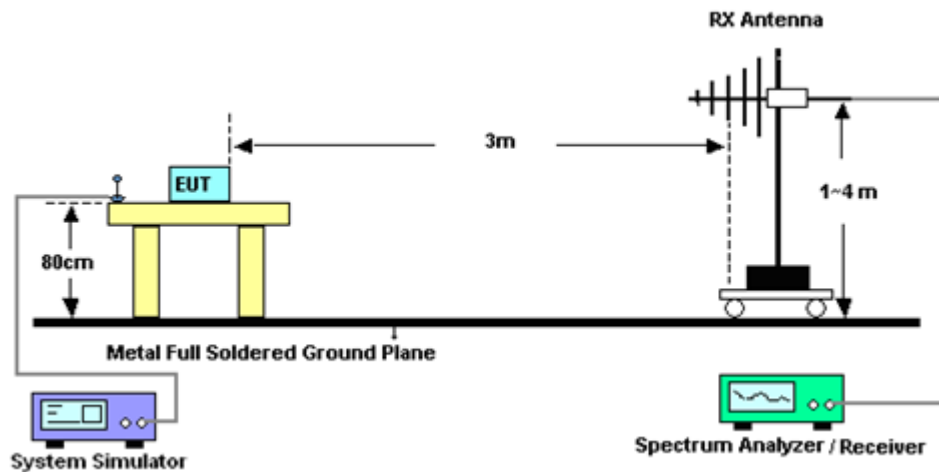
See list of measuring instruments of this test report.

### 4.2 Test Setup

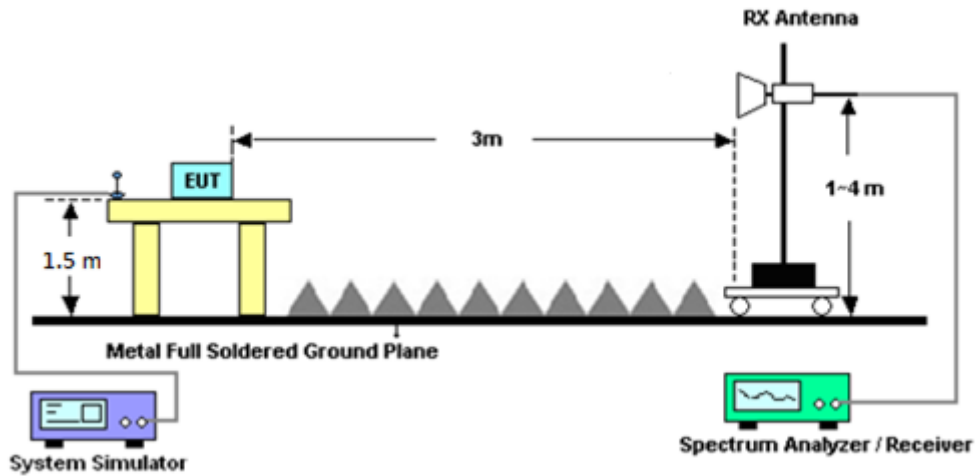
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



### 4.3 Test Result of Radiated Test

Please refer to Appendix B.

**Note:**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



## 4.4 Field Strength of Spurious Radiation Measurement

### 4.4.1 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.

### 4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the 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 for the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking 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.  $ERP (dBm) = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)



## 5 List of Measuring Equipment

| Instrument                | Brand Name     | Model No.                  | Serial No.                      | Characteristics          | Calibration Date | Test Date     | Due Date      | Remark                |
|---------------------------|----------------|----------------------------|---------------------------------|--------------------------|------------------|---------------|---------------|-----------------------|
| Bilog Antenna             | TESEQ          | CBL 6111D & 00800N1D01N-06 | 35419 & 03                      | 30MHz~1GHz               | Apr. 29, 2020    | Aug. 14, 2020 | Apr. 28, 2021 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO           | 3117                       | 00075962                        | 1GHz ~ 18GHz             | Dec. 06, 2019    | Aug. 14, 2020 | Dec. 05, 2020 | Radiation (03CH07-HY) |
| EMI Test Receiver         | Agilent        | N9038A(MXE)                | MY53290053                      | 20Hz~26.5GHz             | May 21, 2020     | Aug. 14, 2020 | May 20, 2021  | Radiation (03CH07-HY) |
| Spectrum Analyzer         | Agilent        | N9030A                     | MY52350276                      | 3Hz~44GHz                | Jun. 09, 2020    | Aug. 14, 2020 | Jun. 08, 2021 | Radiation (03CH07-HY) |
| Preamplifier              | COM-POWER      | PA-103A                    | 161241                          | 10MHz~1GHz               | May 19, 2020     | Aug. 14, 2020 | May 18, 2021  | Radiation (03CH07-HY) |
| Preamplifier              | Agilent        | 8449B                      | 3008A02362                      | 1GHz~26.5GHz             | Nov. 01, 2019    | Aug. 14, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| RF Cable                  | HUBER + SUHNER | SUCOFLEX 102               | MY2858/2,80 1606/2              | 18GHz~40GHz              | Feb. 25, 2020    | Aug. 14, 2020 | Feb. 24, 2021 | Radiation (03CH07-HY) |
| RF Cable                  | HUBER + SUHNER | SUCOFLEX 104               | MY28655/4, MY24971/4, MY15682/4 | 30MHz~1GHz               | Feb. 25, 2020    | Aug. 14, 2020 | Feb. 24, 2021 | Radiation (03CH07-HY) |
| RF Cable                  | HUBER + SUHNER | SUCOFLEX 104               | MY28655/4, MY24971/4, MY15682/4 | 1GHz~18GHz               | Feb. 25, 2020    | Aug. 14, 2020 | Feb. 24, 2021 | Radiation (03CH07-HY) |
| Controller                | ChainTek       | Chaintek 3000              | N/A                             | Control Turn table       | N/A              | Aug. 14, 2020 | N/A           | Radiation (03CH07-HY) |
| Controller                | Max-Full       | MF7802                     | MF78020836 8                    | Control Ant Mast         | N/A              | Aug. 14, 2020 | N/A           | Radiation (03CH07-HY) |
| Antenna Mast              | Max-Full       | MFA520BS                   | N/A                             | 1m~4m                    | N/A              | Aug. 14, 2020 | N/A           | Radiation (03CH07-HY) |
| Turn Table                | ChainTek       | Chaintek 3000              | N/A                             | 0~360 Degree             | N/A              | Aug. 14, 2020 | N/A           | Radiation (03CH07-HY) |
| USB Data Logger           | TECPEL         | TR-32                      | HE17XB2495                      | N/A                      | N/A              | Aug. 14, 2020 | N/A           | Radiation (03CH07-HY) |
| Spectrum Analyzer         | Keysight       | N9010A                     | MY54200485                      | 10Hz~44GHz               | Feb. 10, 2020    | Aug. 14, 2020 | Feb. 09, 2021 | Radiation (03CH07-HY) |
| Horn Antenna              | EMCO           | 3117                       | 00143261                        | 1GHz~18GHz               | Jan. 10, 2020    | Aug. 14, 2020 | Jan. 09, 2021 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBECK    | BBHA 9170                  | BBHA917025 1                    | 18GHz~40GHz              | Nov. 26, 2019    | Aug. 14, 2020 | Nov. 25, 2020 | Radiation (03CH07-HY) |
| Preamplifier              | EMEC           | EM18G40G                   | 060715                          | 18GHz~40GHz              | Dec. 13, 2019    | Aug. 14, 2020 | Dec. 12, 2020 | Radiation (03CH07-HY) |
| Software                  | Audix          | E3 6.2009-8-24             | N/A                             | N/A                      | N/A              | Aug. 14, 2020 | N/A           | Radiation (03CH07-HY) |
| Signal Generator          | Anritsu        | MG3710A                    | 6261943042                      | 2G / 3G / LTE / 5G FR1   | May 10, 2020     | Aug. 14, 2020 | May 09, 2021  | Radiation (03CH07-HY) |
| Base Station              | Anritsu        | MT8821C                    | 6201341950                      | GSM / GPRS / WCDMA / LTE | Oct. 31, 2019    | Aug. 27, 2020 | Oct. 30, 2020 | Conducted (TH03-HY)   |



## 6 Uncertainty of Evaluation

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

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.35 |
|---|------|

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.81 |
|---|------|

### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

|   |      |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.85 |
|---|------|



## Appendix A. Test Results of Conducted Test

### Conducted Output Power(Average power)

| Conducted Power (*Unit: dBm) |        |              |       |              |              |        |
|------------------------------|--------|--------------|-------|--------------|--------------|--------|
| Band                         | GSM850 |              |       | GSM1900      |              |        |
| Channel                      | 128    | 189          | 251   | 512          | 661          | 810    |
| Frequency                    | 824.2  | 836.4        | 848.8 | 1850.2       | 1880         | 1909.8 |
| GPRS class 8                 | 32.18  | <b>32.26</b> | 32.20 | 28.99        | <b>29.01</b> | 28.88  |
| GPRS class 10                | 29.38  | 29.45        | 29.38 | 26.14        | 26.17        | 26.02  |
| GPRS class 11                | 27.60  | 27.67        | 27.61 | 24.37        | 24.38        | 24.24  |
| GPRS class 12                | 26.44  | 26.52        | 26.45 | 23.17        | 23.18        | 23.04  |
| EGPRS class 8                | 26.35  | <b>26.42</b> | 26.35 | <b>24.89</b> | <b>24.89</b> | 24.75  |
| EGPRS class 10               | 23.49  | 23.55        | 23.50 | 22.05        | 22.06        | 21.92  |
| EGPRS class 11               | 21.66  | 21.74        | 21.68 | 20.20        | 20.22        | 20.09  |
| EGPRS class 12               | 20.47  | 20.52        | 20.46 | 19.04        | 19.05        | 18.93  |

| Conducted Power (*Unit: dBm) |              |       |       |               |              |        |
|------------------------------|--------------|-------|-------|---------------|--------------|--------|
| Band                         | WCDMA Band V |       |       | WCDMA Band II |              |        |
| Channel                      | 4132         | 4182  | 4233  | 9262          | 9400         | 9538   |
| Frequency                    | 826.4        | 836.4 | 846.6 | 1852.4        | 1880         | 1907.6 |
| RMC 12.2K                    | <b>23.40</b> | 23.18 | 23.00 | 22.77         | <b>23.18</b> | 22.52  |
| HSDPA Subtest-1              | 22.00        | 21.95 | 22.01 | 22.49         | 22.19        | 22.08  |
| HSDPA Subtest-2              | 21.88        | 22.02 | 21.76 | 22.46         | 22.30        | 22.05  |
| HSDPA Subtest-3              | 22.11        | 21.83 | 22.01 | 22.10         | 22.08        | 22.04  |
| HSDPA Subtest-4              | 22.23        | 22.06 | 22.12 | 22.35         | 22.28        | 21.98  |
| HSUPA Subtest-1              | 21.76        | 21.51 | 21.75 | 22.16         | 22.09        | 21.79  |
| HSUPA Subtest-2              | 20.37        | 20.51 | 20.26 | 20.78         | 20.88        | 20.53  |
| HSUPA Subtest-3              | 21.52        | 21.22 | 21.25 | 21.93         | 21.69        | 21.40  |
| HSUPA Subtest-4              | 20.74        | 20.71 | 20.72 | 20.94         | 20.80        | 20.86  |
| HSUPA Subtest-5              | 22.63        | 22.62 | 22.49 | 22.69         | 22.53        | 22.12  |





## Appendix B. Test Results of ERP/EIRP and Radiated Test

### ERP/EIRP

| Channel | Mode                | Conducted   |               | ERP      |        |
|---------|---------------------|-------------|---------------|----------|--------|
|         |                     | Power (dBm) | Power (Watts) | ERP(dBm) | ERP(W) |
| Lowest  | GSM850              | 32.18       | 1.6520        | 32.22    | 1.6672 |
| Middle  | GPRS class 8        | 32.26       | 1.6827        | 32.30    | 1.6982 |
| Highest | (GT - LC = 2.19 dB) | 32.20       | 1.6596        | 32.24    | 1.6749 |
| Lowest  | GSM850              | 26.35       | 0.4315        | 26.39    | 0.4355 |
| Middle  | EDGE class 8        | 26.42       | 0.4385        | 26.46    | 0.4426 |
| Highest | (GT - LC = 2.19 dB) | 26.35       | 0.4315        | 26.39    | 0.4355 |
| Lowest  | WCDMA Band V        | 23.40       | 0.2188        | 23.44    | 0.2208 |
| Middle  | RMC 12.2Kbps        | 23.18       | 0.2080        | 23.22    | 0.2099 |
| Highest | (GT - LC = 2.19 dB) | 23.00       | 0.1995        | 23.04    | 0.2014 |
| Limit   | ERP < 7W            | Result      |               | PASS     |        |

| Channel | Mode                | Conducted   |               | EIRP      |         |
|---------|---------------------|-------------|---------------|-----------|---------|
|         |                     | Power (dBm) | Power (Watts) | EIRP(dBm) | EIRP(W) |
| Lowest  | GSM1900             | 28.99       | 0.7925        | 31.04     | 1.2706  |
| Middle  | GPRS class 8        | 29.01       | 0.7962        | 31.06     | 1.2764  |
| Highest | (GT - LC = 2.05 dB) | 28.88       | 0.7727        | 30.93     | 1.2388  |
| Lowest  | GSM1900             | 24.89       | 0.3083        | 26.94     | 0.4943  |
| Middle  | EDGE class 8        | 24.89       | 0.3083        | 26.94     | 0.4943  |
| Highest | (GT - LC = 2.05 dB) | 24.75       | 0.2985        | 26.80     | 0.4786  |
| Lowest  | WCDMA Band II       | 22.77       | 0.1892        | 24.82     | 0.3034  |
| Middle  | RMC 12.2Kbps        | 23.18       | 0.2080        | 25.23     | 0.3334  |
| Highest | (GT - LC = 2.05 dB) | 22.52       | 0.1786        | 24.57     | 0.2864  |
| Limit   | EIRP < 2W           | Result      |               | PASS      |         |



**Radiated Spurious Emission**

**GPRS850**

| GPRS 850 |                   |             |               |                   |                   |                    |                      |                       |                    |
|----------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel  | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Highest  | 1696              | -52.90      | -13           | -39.90            | -65.5             | -54.5              | 1.00                 | 4.75                  | H                  |
|          | 2544              | -30.02      | -13           | -17.02            | -47.37            | -32                | 1.30                 | 5.44                  | H                  |
|          | 4248              | -53.80      | -13           | -40.80            | -74.62            | -58.4              | 1.90                 | 8.65                  | H                  |
|          | 5096              | -52.44      | -13           | -39.44            | -76.04            | -57.6              | 2.39                 | 9.70                  | H                  |
|          | 5944              | -49.25      | -13           | -36.25            | -74.65            | -54.1              | 2.88                 | 9.88                  | H                  |
|          |                   |             |               |                   |                   |                    |                      |                       | H                  |
|          |                   |             |               |                   |                   |                    |                      |                       | H                  |
|          | 1696              | -55.80      | -13           | -42.80            | -68.8             | -57.4              | 1.00                 | 4.75                  | V                  |
|          | 2544              | -27.82      | -13           | -14.82            | -45.37            | -29.8              | 1.30                 | 5.44                  | V                  |
|          | 4248              | -53.70      | -13           | -40.70            | -74.28            | -58.3              | 1.90                 | 8.65                  | V                  |
|          | 5096              | -51.64      | -13           | -38.64            | -74.76            | -56.8              | 2.39                 | 9.70                  | V                  |
|          | 5944              | -49.85      | -13           | -36.85            | -75.51            | -54.7              | 2.88                 | 9.88                  | V                  |
|          |                   |             |               |                   |                   |                    |                      |                       | V                  |
|          |                   |             |               |                   |                   |                    |                      |                       | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



**WCDMA 850**

| WCDMA 850 |                   |             |               |                   |                   |                    |                      |                       |                    |
|-----------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel   | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Highest   | 1696              | -54.00      | -13           | -41.00            | -66.14            | -55.6              | 1.00                 | 4.75                  | H                  |
|           | 2536              | -38.02      | -13           | -25.02            | -55.3             | -40                | 1.30                 | 5.43                  | H                  |
|           | 3386              | -57.72      | -13           | -44.72            | -77.28            | -61.5              | 1.57                 | 7.50                  | H                  |
|           |                   |             |               |                   |                   |                    |                      |                       | H                  |
|           |                   |             |               |                   |                   |                    |                      |                       | H                  |
|           |                   |             |               |                   |                   |                    |                      |                       | H                  |
|           |                   |             |               |                   |                   |                    |                      |                       | H                  |
|           | 1696              | -49.50      | -13           | -36.50            | -62.13            | -51.1              | 1.00                 | 4.75                  | V                  |
|           | 2536              | -32.82      | -13           | -19.82            | -50.46            | -34.8              | 1.30                 | 5.43                  | V                  |
|           | 3386              | -57.82      | -13           | -44.82            | -77.46            | -61.6              | 1.57                 | 7.50                  | V                  |
|           |                   |             |               |                   |                   |                    |                      |                       | V                  |
|           |                   |             |               |                   |                   |                    |                      |                       | V                  |
|           |                   |             |               |                   |                   |                    |                      |                       | V                  |
|           |                   |             |               |                   |                   |                    |                      |                       | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



**GPRS 1900**

| GPRS 1900 |                   |              |               |                   |                   |                    |                      |                       |                    |   |
|-----------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|---|
| Channel   | Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |   |
| Lowest    | 3702              | -55.93       | -13           | -42.93            | -76.51            | -62.5              | 1.67                 | 8.24                  | H                  |   |
|           | 5550              | -35.03       | -13           | -22.03            | -59.8             | -42.1              | 2.65                 | 9.72                  | H                  |   |
|           | 7404              | -52.95       | -13           | -39.95            | -80.21            | -62.1              | 2.46                 | 11.61                 | H                  |   |
|           | 9252              | -45.04       | -13           | -32.04            | -75.56            | -55.1              | 2.54                 | 12.60                 | H                  |   |
|           |                   |              |               |                   |                   |                    |                      |                       |                    | H |
|           |                   |              |               |                   |                   |                    |                      |                       |                    | H |
|           |                   |              |               |                   |                   |                    |                      |                       |                    | H |
|           | 3702              | -55.53       | -13           | -42.53            | -76.18            | -62.1              | 1.67                 | 8.24                  | V                  |   |
|           | 5550              | -39.13       | -13           | -26.13            | -63.87            | -46.2              | 2.65                 | 9.72                  | V                  |   |
|           | 7404              | -52.75       | -13           | -39.75            | -80.29            | -61.9              | 2.46                 | 11.61                 | V                  |   |
|           | 9252              | -48.04       | -13           | -35.04            | -78.81            | -58.1              | 2.54                 | 12.60                 | V                  |   |
|           |                   |              |               |                   |                   |                    |                      |                       |                    | V |
|           |                   |              |               |                   |                   |                    |                      |                       |                    | V |
|           |                   |              |               |                   |                   |                    |                      |                       |                    | V |
|           |                   |              |               |                   |                   |                    |                      |                       | V                  |   |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



**WCDMA 1900**

| WCDMA 1900 |                   |              |               |                   |                   |                    |                      |                       |                    |
|------------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel    | Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Highest    | 3816              | -35.62       | -13           | -22.62            | -55.94            | -42.3              | 1.70                 | 8.38                  | H                  |
|            | 5724              | -54.46       | -13           | -41.46            | -79.82            | -61.5              | 2.75                 | 9.79                  | H                  |
|            | 7631              | -53.01       | -13           | -40.01            | -80.93            | -62.5              | 2.39                 | 11.88                 | H                  |
|            |                   |              |               |                   |                   |                    |                      |                       | H                  |
|            |                   |              |               |                   |                   |                    |                      |                       | H                  |
|            |                   |              |               |                   |                   |                    |                      |                       | H                  |
|            |                   |              |               |                   |                   |                    |                      |                       | H                  |
|            | 3816              | -44.32       | -13           | -31.32            | -64.55            | -51                | 1.70                 | 8.38                  | V                  |
|            | 5724              | -54.56       | -13           | -41.56            | -79.67            | -61.6              | 2.75                 | 9.79                  | V                  |
|            | 7631              | -53.11       | -13           | -40.11            | -81               | -62.6              | 2.39                 | 11.88                 | V                  |
|            |                   |              |               |                   |                   |                    |                      |                       | V                  |
|            |                   |              |               |                   |                   |                    |                      |                       | V                  |
|            |                   |              |               |                   |                   |                    |                      |                       | V                  |
|            |                   |              |               |                   |                   |                    |                      |                       | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



## **Appendix D. Original Report**

Please refer to Sporton report number FG692114-05 as below.