# **FCC Test Report**

APPLICANT : Hi-P Electronics Pte Ltd

**EQUIPMENT**: Mobile Phone

BRAND NAME : Hi-P MODEL NAME : H450R

FCC ID : 2ACUZH450R

STANDARD : FCC 47 CFR FCC Part 15 Subpart B

CLASSIFICATION : Certification

The product was received on May 14, 2015 and testing was completed on Jun. 11, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2009 and has been in 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Louis Wu / Manager

Lunis Win

Approved by: Jones Tsai / Manager

## SPORTON INTERNATIONAL (SHENZHEN) INC.

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Testing Laboratory 2353

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## **REVISION HISTORY**

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FC551401   | Rev. 01 | Initial issue of report | Jul. 21, 2015 |
|            |         |                         |               |
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## **SUMMARY OF TEST RESULT**

| Report<br>Section | FCC Rule | Description              | Limit           | Result | Remark      |
|-------------------|----------|--------------------------|-----------------|--------|-------------|
|                   |          |                          |                 |        | Under limit |
| 3.1               | 15.107   | AC Conducted Emission    | < 15.107 limits | PASS   | 4.26 dB at  |
|                   |          |                          |                 |        | 0.520 MHz   |
|                   |          |                          |                 |        | Under limit |
| 3.2               | 15.109   | Radiated Emission        | < 15.109 limits | DAGG   | 3.03 dB at  |
| 3.2               | 15.109   | 15.109 Radiated Emission | < 15.109 minus  | PASS   | 240.060 MHz |
|                   |          |                          |                 |        | for Peak    |

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## 1. General Description

## 1.1. Applicant

#### **Hi-P Electronics Pte Ltd**

12 Ang Mo Kio Street 64, #03-02, UE BizHub Central Blk A, Singapore 569088

### 1.2. Manufacturer

### Hi-P Electronics Technology Co Ltd (Suzhou)

No.86 Liu Feng Road, Wu Zhong District, Jiangsu China Suzhou: 215128

## 1.3. Product Feature of Equipment Under Test

|                                 | Product Feature   |
|---------------------------------|---|
| Equipment                       | Mobile Phone  |
| Brand Name                      | Hi-P  |
| Model Name                      | H450R   |
| FCC ID                          | 2ACUZH450R  |
| EUT supports Radios application | GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/<br>WLAN 2.4GHz 802.11b/g/n HT20/HT40/<br>Bluetooth v3.0+EDR/Bluetooth v4.0 LE |
| IMEI Code                       | Conduction: 004402800006292<br>Radiation: 004402800006276   |
| HW Version                      | A850-03A  |
| SW Version                      | A850_03A_HI-P_FWVGA_BAND245_V002_20150512_1200  |
| EUT Stage                       | Pre-Production  |

Remark:

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

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## 1.4. Product Specification subjective to this standard

| Product Specification subjective to this standard |   |  |  |  |  |
|---|---|--|--|--|--|
|   | GSM850 : 824.2 MHz ~ 848.8 MHz                |  |  |  |  |
|   | GSM1900 : 1850.2 MHz ~ 1909.8MHz              |  |  |  |  |
|   | WCDMA Band V : 826.4 MHz ~ 846.6 MHz          |  |  |  |  |
| Tx Frequency                                      | WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz       |  |  |  |  |
|   | WCDMA Band II : 1852.4 MHz ~ 1907.6 MHz       |  |  |  |  |
|   | 802.11b/g/n: 2412 MHz ~ 2462 MHz              |  |  |  |  |
|   | Bluetooth: 2402 MHz ~ 2480 MHz                |  |  |  |  |
|   | GSM850 : 869.2 MHz ~ 893.8 MHz                |  |  |  |  |
|   | GSM1900 : 1930.2 MHz ~ 1989.8 MHz             |  |  |  |  |
|   | WCDMA Band V : 871.4 MHz ~ 891.6 MHz          |  |  |  |  |
|   | WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz       |  |  |  |  |
| Rx Frequency                                      | WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz       |  |  |  |  |
|   | 802.11b/g/n: 2412 MHz ~ 2462 MHz              |  |  |  |  |
|   | Bluetooth: 2402 MHz ~ 2480 MHz                |  |  |  |  |
|   | GPS : 1.57542 GHz                             |  |  |  |  |
|   | WWAN : Fixed Internal Antenna                 |  |  |  |  |
| A   | WLAN: PIFA Antenna                            |  |  |  |  |
| Antenna Type                                      | Bluetooth : PIFA Antenna                      |  |  |  |  |
|   | GPS: PIFA Antenna                             |  |  |  |  |
|   | GSM: GMSK                                     |  |  |  |  |
|   | GPRS: GMSK                                    |  |  |  |  |
|   | EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK         |  |  |  |  |
|   | WCDMA: QPSK (Uplink)                          |  |  |  |  |
|   | HSDPA / DC-HSDAP: QPSK (Uplink)               |  |  |  |  |
|   | HSUPA: QPSK (Uplink)                          |  |  |  |  |
| Type of Modulation                                | HSPA+: 16QAM(Downlink Only)                   |  |  |  |  |
| Type of Modulation                                | 802.11b: DSSS (DBPSK / DQPSK / CCK)           |  |  |  |  |
|   | 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) |  |  |  |  |
|   | Bluetooth LE : GFSK                           |  |  |  |  |
|   | Bluetooth (1Mbps) : GFSK                      |  |  |  |  |
|   | Bluetooth (2Mbps) : π /4-DQPSK                |  |  |  |  |
|   | Bluetooth (3Mbps) : 8-DPSK                    |  |  |  |  |
|   | GPS: BPSK                                     |  |  |  |  |

## 1.5. Modification of EUT

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

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### 1.6. Test Location

| Test Site          | SPORTON INTERNATIONAL (SHENZHEN) INC.                                  |  |  |  |
|--------------------|--|--|--|--|
|                    | 1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili |  |  |  |
| Test Site Location | Town, Nanshan District, Shenzhen, Guangdong, P. R. China               |  |  |  |
| rest Site Location | TEL: +86-755-8637-9589   |  |  |  |
|                    | FAX: +86-755-8637-9595   |  |  |  |
| Took Site No       | Sporton Site No.   |  |  |  |
| Test Site No.      | CO01-SZ  |  |  |  |

| Test Site          | SPORTON INTERNATIONAL (SHENZHEN) INC.                                  |  |  |  |  |
|--------------------|--|--|--|--|--|
|                    | No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan |  |  |  |  |
| Test Site Location | warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China          |  |  |  |  |
|                    | TEL: +86-755- 3320-2398  |  |  |  |  |
| Took Site No       | Sporton Site No. FCC Registration N                                    |  |  |  |  |
| Test Site No.      | 03CH01-SZ 831040   |  |  |  |  |

## 1.7. Applicable Standards

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

- FCC 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2009

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

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## 2. Test Configuration of Equipment Under Test

### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test modes as the worst cases and recorded in this report.

|      |                                   | Test Condition |             |           |  |
|------|-----------------------------------|----------------|-------------|-----------|--|
| Item | EUT Configuration                 | EMI            | EMI         | EMI       |  |
|      |                                   | AC             | RE<1G       | RE≥1G     |  |
| 1.   | Charging Mode (EUT with adapter)  | $\boxtimes$    | $\boxtimes$ | Note 1    |  |
| 2.   | Data application transferred mode |                | $\boxtimes$ | $\bowtie$ |  |
|      | (EUT connected with notebook)     |                |             |           |  |

#### Abbreviations:

EMI AC: AC conducted emissions

EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz

• EMI RE < 1G: EUT radiated emissions < 1GHz

Note 1: Testing for this mode is not required or not the worst case.

**Remark:** For signal above 1GHz, the worst case was test item 2.

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| Test Items                   | EUT<br>Configure<br>Mode | Function Type  |
|------------------------------|--------------------------|--|
|                              |                          | Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Earphone + Camera <fig.1></fig.1>               |
| AC Conducted<br>Emission     | 1/2                      | Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB<br>Cable (Charging from Adapter) + Earphone +<br>MPEG4 <fig.1></fig.1>   |
|                              |                          | Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB<br>Cable (Data Link with Notebook) + Earphone + GPS<br>Rx <fig.2></fig.2> |
|                              | 1/2                      | Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Earphone + Camera <fig.1></fig.1>               |
| Radiated<br>Emissions < 1GHz |                          | Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB<br>Cable (Charging from Adapter) + Earphone +<br>MPEG4 <fig.1></fig.1>   |
|                              |                          | Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB<br>Cable (Data Link with Notebook) + Earphone + GPS<br>Rx <fig.2></fig.2> |
| Radiated<br>Emissions ≥ 1GHz | 2                        | Mode 1: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB<br>Cable (Data Link with Notebook) + Earphone + GPS<br>Rx <fig.2></fig.2> |

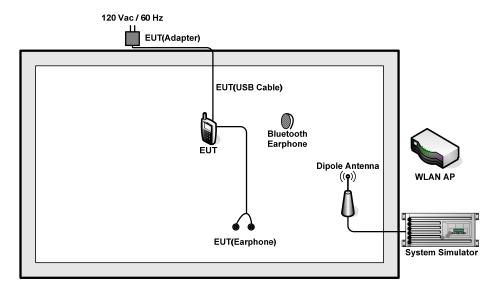
#### Remark:

- 1. The worst case of AC is mode 1 and the USB Link mode of AC is mode 3, the test data of these modes were reported.
- 2. The worst case of RE < 1G is mode 3; only the test data of this mode was reported.
- 3. Link with Notebook means data application transferred mode between EUT and Notebook.

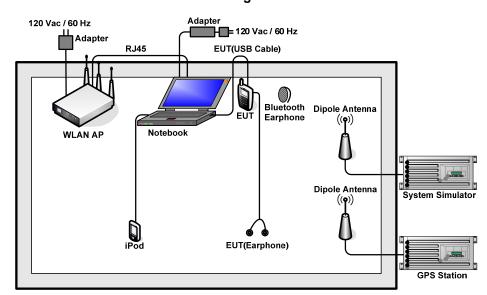
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## 2.2. Connection Diagram of Test System



<Fig.1>



<Fig.2>

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## 2.3. Support Unit used in test configuration and system

| Item | Equipment             | Trade Name | Model Name | FCC ID      | Data Cable        | Power Cord   |
|------|-----------------------|------------|------------|-------------|-------------------|--|
| 1.   | System Simulator      | R&S        | CMU200     | N/A         | N/A               | Unshielded, 1.8 m  |
| 2.   | GPS Station           | ADIVIC     | MP9000     | N/A         | N/A               | Unshielded, 1.8 m  |
| 3.   | Notebook              | Lenovo     | E540       | PRC4        | N/A               | AC I/P:<br>Unshielded, 1.2 m<br>DC O/P:<br>Shielded, 1.8 m |
| 4.   | Bluetooth<br>Earphone | Nokia      | BH-106     | QTLBH-106   | N/A               | N/A  |
| 5.   | Bluetooth<br>Earphone | Nokia      | BH-108     | PYAHS-107W  | N/A               | N/A  |
| 6.   | WLAN AP               | D-Link     | DIR-855    | KA2DIR855A2 | N/A               | Unshielded, 1.8 m  |
| 7.   | WLAN AP               | D-Link     | DIR-628    | KA2DIR628A2 | N/A               | Unshielded, 1.8 m  |
| 8.   | iPod                  | Apple      | A1199      | FCC DoC     | Unshielded, 1.2 m | N/A  |

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## 2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and was in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

- 1. Data application is transferred between Notebook and EUT via USB cable.
- 2. Execute "Video Player" to play MPEG4 files.
- 3. Turn on camera to capture images.
- 4. Turn on GPS function to make the EUT receive continuous signals from GPS station.

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## 3. Test Result

### 3.1. Test of AC Conducted Emission Measurement

#### 3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of emission | Conducted limit (dBuV) |           |  |  |  |
|-----------------------|------------------------|-----------|--|--|--|
| (MHz)                 | Quasi-peak             | Average   |  |  |  |
| 0.15-0.5              | 66 to 56*              | 56 to 46* |  |  |  |
| 0.5-5                 | 56                     | 46        |  |  |  |
| 5-30                  | 60                     | 50        |  |  |  |

<sup>\*</sup>Decreases with the logarithm of the frequency.

### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.1.3 Test Procedure

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least
   80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

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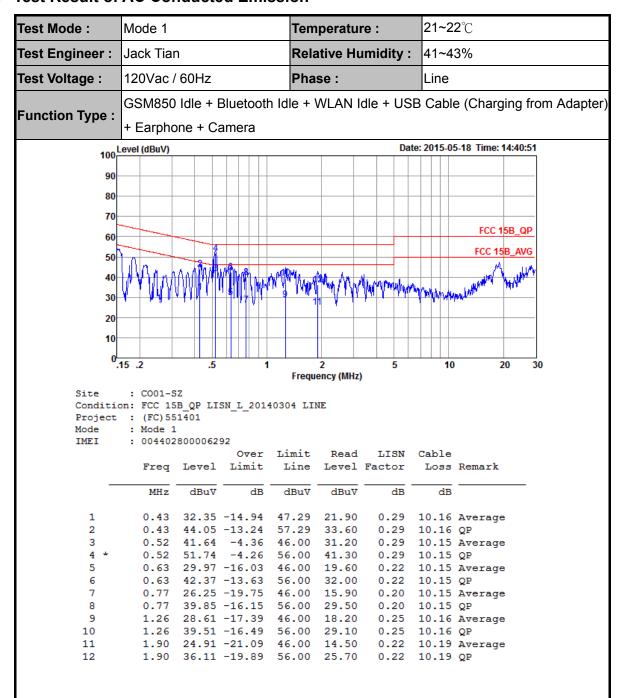
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### 3.1.4 Test Setup



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#### 3.1.5 Test Result of AC Conducted Emission



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| Test Mode :             | Mode 1  |  |   | Tem  | peratur  | e:   | 21~22  | 2℃   |             |
|-------------------------|---|--|---|--|--|--|--|--|-------------|
| Test Engineer :         | Jack Tian   |  |   | Rela   | tive Hu  | midity:  | 41~43  | 3%   |             |
| Test Voltage :          | 120Vac /  | 60Hz   |   | Phas   | se:  |  | Neutra   | al   |             |
|                         | GSM850  | Idle + B   | luetooth  | ı ldle + V   | VLAN I   | dle + USE  | 3 Cable  | (Charging t  | from Adapte |
| Function Type :         | + Earphone + Camera                               |  |   |  |  |  |  |  |             |
| 100L                    | _evel (dBuV)                                      |  |   |  |  | Dat  | e: 2015-0  | 5-18 Time: 14:37   | :02         |
| 90-                     |   |  |   |  |  |  |  |  |             |
|                         |   |  |   |  |  |  |  |  |             |
| 80                      |   |  |   |  |  |  |  |  |             |
| 70                      | _   |  |   |  |  |  |  |  | _           |
| 60                      | -   |  |   |  |  |  |  | FCC 15B_Q  | <u>)P</u>   |
| 50                      | A   |  |   |  |  |  |  | FCC 15B_AV   | ∕G          |
|                         | MANN PLANS  | 12   |   |  |  |  |  | A u  | M           |
| 40                      | <b>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 </b>     | W/W/W <sup>*</sup>   | WYMANIA   | produced the later of the later | alar Int.  |  |  | A A STATE OF THE PROPERTY OF THE PARTY OF TH |             |
| 30                      | <del>                                     </del>  | 111111   | 1 . It is the bill  | Mark neuk  | C. L. B. Walder  | harbital balantan barbi  | WALL CHANGE OF   | A A A A A A A A A A A A A A A A A A A  | _           |
| 20                      |   |  |   |  |  |  |  |  |             |
| 10                      |   |  |   |  |  |  |  |  |             |
| -                       |   |  |   |  |  |  |  |  |             |
| 0.                      | 15 .2   | .5   | 1   |  | 2<br>ency (MHz)  | 5  | 10   | 20   | 30          |
| Site                    | : CO01-S  | 7  |   | rioqu  | circy (miriz   | ,  |  |  |             |
|                         | on: FCC 15  |  | 5N N 201  | 40304 NE   | UTRAL  |  |  |  |             |
| _                       | : (FC)55  | 1401   |   |  |  |  |  |  |             |
|                         |   |  |   |  |  |  |  |  |             |
| Mode<br>TMET            | : Mode 1  |  | 92  |  |  |  |  |  |             |
| Mode<br>IMEI            | : Mode 1<br>: 004402                              |  | 92<br>Over  | Limit  | Read   | LISN   | Cable  |  |             |
|                         | : 004402  | 8000062  |   |  |  | LISN<br>Factor   |  | Remark   |             |
|                         | : 004402<br>Freq                                  | 180000629<br>Level   | Over<br>Limit   | Line   | Level  | Factor   | Loss   | Remark   | -           |
|                         | : 004402  | 8000062  | Over  |  |  |  |  | Remark   | -           |
| IMEI                    | : 004402<br>Freq<br>MHz<br>0.15                   | Level<br>dBuV  | Over<br>Limit<br>dB   | Line dBuV 55.82  | dBuV   | ## Tactor dB - 0.33  | Loss<br>dB<br>10.36  | Average  | -           |
| IMEI — 1 2              | Freq  MHz  0.15 0.15                              | dBuV<br>44.48<br>55.88   | Over<br>Limit<br>dB<br>-11.34<br>-9.94  | dBuV<br>55.82<br>65.82   | dBuV<br>33.79<br>45.19   | dB - 0.33 0.33   | dB<br>10.36<br>10.36   | Average<br>QP  |             |
| IMEI                    | ### 0.15<br>0.15<br>0.15<br>0.18                  | Level dBuV 44.48 55.88 38.44   | Over<br>Limit<br>dB<br>-11.34<br>-9.94<br>-15.93  | dBuV<br>55.82<br>65.82   | dBuV<br>33.79<br>45.19<br>27.81  | Tactor  dB  0.33 0.33 0.32   | dB<br>10.36<br>10.36   | Average<br>QP<br>Average   | -           |
| IMEI                    | ### 0.15<br>0.15<br>0.15<br>0.18                  | Level dBuV 44.48 55.88 38.44 51.84   | Over<br>Limit<br>———————————————————————————————————  | Dine dBuV 55.82 65.82 54.37  | dBuV<br>33.79<br>45.19<br>27.81<br>41.21                                     | 0.33<br>0.33<br>0.32<br>0.32   | dB<br>10.36<br>10.36<br>10.31<br>10.31                               | Average<br>QP<br>Average   |             |
| IMEI  1 2 3 4 5 6       | ### Freq  MHz  0.15 0.15 0.18 0.18 0.21 0.21      | dBuV<br>44.48<br>55.88<br>38.44<br>51.84<br>34.31<br>47.41                     | Over<br>Limit<br>dB<br>-11.34<br>-9.94<br>-15.93<br>-12.53<br>-18.87<br>-15.77  | Dine dBuV 55.82 65.82 54.37 64.37 53.18 63.18  | dBuV<br>33.79<br>45.19<br>27.81<br>41.21<br>23.70<br>36.80                   | 0.33<br>0.33<br>0.32<br>0.32<br>0.32<br>0.33<br>0.33                   | dB 10.36 10.36 10.31 10.31 10.28 10.28                               | Average<br>QP<br>Average<br>QP<br>Average<br>QP  |             |
| IMEI  1 2 3 4 5 6 7     | ### Freq  MHz  0.15 0.15 0.18 0.18 0.21 0.21 0.24 | dBuV<br>44.48<br>55.88<br>38.44<br>51.84<br>34.31<br>47.41<br>30.49            | Over<br>Limit<br>dB<br>-11.34<br>-9.94<br>-15.93<br>-12.53<br>-18.87<br>-15.77<br>-21.51  | Dine dBuV 55.82 65.82 54.37 64.37 53.18 63.18 52.00  | dBuV<br>33.79<br>45.19<br>27.81<br>41.21<br>23.70<br>36.80<br>19.90          | 0.33<br>0.33<br>0.32<br>0.32<br>0.32<br>0.33<br>0.33                   | dB 10.36 10.36 10.31 10.31 10.28 10.28                               | Average QP Average QP Average QP Average QP Average  | -           |
| IMEI  1 2 3 4 5 6       | ### MHz  0.15 0.15 0.18 0.18 0.21 0.21 0.24 0.24  | Level  dBuV  44.48 55.88 38.44 51.84 34.31 47.41 30.49 43.89                   | Over<br>Limit<br>dB<br>-11.34<br>-9.94<br>-15.93<br>-12.53<br>-18.87<br>-15.77<br>-21.51<br>-18.11                              | Dine dBuV 55.82 65.82 54.37 64.37 53.18 63.18 52.00 62.00  | dBuV<br>33.79<br>45.19<br>27.81<br>41.21<br>23.70<br>36.80<br>19.90<br>33.30 | 0.33<br>0.33<br>0.32<br>0.32<br>0.32<br>0.33<br>0.33<br>0.34           | dB 10.36 10.36 10.31 10.28 10.28 10.25                               | Average QP Average QP Average QP Average QP Average QP   |             |
| IMEI  1 2 3 4 5 6 7 8   | ### 1004402    Freq                               | Level  dBuV  44.48 55.88 38.44 51.84 34.31 47.41 30.49 43.89 27.37 40.17       | Over<br>Limit<br>-11.34<br>-9.94<br>-15.93<br>-12.53<br>-18.87<br>-15.77<br>-21.51<br>-18.11<br>-23.53<br>-20.73                | Dine  dBuV  55.82 65.82 54.37 64.37 53.18 63.18 52.00 62.00 50.90 60.90  | dBuV  33.79 45.19 27.81 41.21 23.70 36.80 19.90 33.30 16.80 29.60            | Factor  dB  0.33 0.33 0.32 0.32 0.33 0.34 0.34 0.35 0.35               | dB  10.36 10.36 10.31 10.31 10.28 10.25 10.25 10.25 10.22            | Average QP Average QP Average QP Average QP Average QP Average   |             |
| IMEI  1 2 3 4 5 6 7 8 9 | ### 1004402    Freq                               | Level  dBuV  44.48 55.88 38.44 51.84 34.31 47.41 30.49 43.89 27.37 40.17 37.25 | Over<br>Limit<br>dB<br>-11.34<br>-9.94<br>-15.93<br>-12.53<br>-18.87<br>-15.77<br>-21.51<br>-18.11<br>-23.53<br>-20.73<br>-8.75 | Dine  dBuV  55.82 65.82 54.37 64.37 53.18 63.18 52.00 62.00 50.90  | dBuV  33.79 45.19 27.81 41.21 23.70 36.80 19.90 33.30 16.80 29.60 26.70      | Factor  dB  0.33  0.33  0.32  0.32  0.33  0.34  0.34  0.35  0.35  0.39 | dB 10.36 10.36 10.31 10.31 10.28 10.25 10.25 10.25 10.25 10.22 10.16 | Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average  | -           |

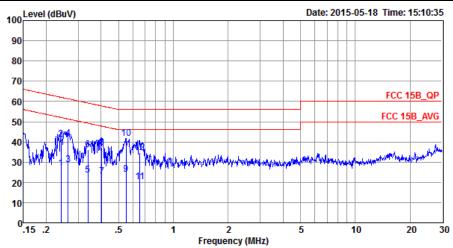
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21~22℃ Test Mode: Mode 3 Temperature: Test Engineer: Jack Tian Relative Humidity: 41~43% Test Voltage: 120Vac / 60Hz Phase: Line WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with

Function Type: Notebook) + Earphone + GPS Rx



: CO01-SZ Site

Condition: FCC 15B\_QP LISN\_L\_20140304 LINE

Project : (FC) 551401 Mode

: Mode 3

IMEI : 004402800006292

|      |      |       | Over   | Limit | Read  | LISN   | Cable |         |
|------|------|-------|--------|-------|-------|--------|-------|---------|
|      | Freq | Level | Limit  | Line  | Level | Factor | Loss  | Remark  |
|      | MHz  | dBu∇  | dB     | dBu∇  | dBu∇  | dB     | dB    |         |
| 1    | 0.24 | 26.89 | -25.15 | 52.04 | 16.40 | 0.24   | 10.25 | Average |
| 2    | 0.24 | 41.49 | -20.55 | 62.04 | 31.00 | 0.24   | 10.25 | QP      |
| 3    | 0.26 | 28.77 | -22.52 | 51.29 | 18.30 | 0.24   | 10.23 | Average |
| 4    | 0.26 | 41.87 | -19.42 | 61.29 | 31.40 | 0.24   | 10.23 | QP      |
| 5    | 0.34 | 23.45 | -25.77 | 49.22 | 12.99 | 0.27   | 10.19 | Average |
| 6    | 0.34 | 36.15 | -23.07 | 59.22 | 25.69 | 0.27   | 10.19 | QP      |
| 7    | 0.40 | 22.95 | -24.82 | 47.77 | 12.50 | 0.28   | 10.17 | Average |
| 8    | 0.40 | 37.45 | -20.32 | 57.77 | 27.00 | 0.28   | 10.17 | QP      |
| 9    | 0.55 | 23.92 | -22.08 | 46.00 | 13.50 | 0.27   | 10.15 | Average |
| 10 * | 0.55 | 41.52 | -14.48 | 56.00 | 31.10 | 0.27   | 10.15 | QP      |
| 11   | 0.65 | 20.26 | -25.74 | 46.00 | 9.90  | 0.21   | 10.15 | Average |
| 12   | 0.65 | 34.76 | -21.24 | 56.00 | 24.40 | 0.21   | 10.15 | QP      |

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**21~22**℃ Test Mode: Mode 3 Temperature: Test Engineer: Jack Tian Relative Humidity: 41~43% 120Vac / 60Hz Phase: Test Voltage: Neutral WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with **Function Type:** Notebook) + Earphone + GPS Rx 100 Level (dBuV) Date: 2015-05-18 Time: 15:13:38 90 80 70 FCC 15B\_QP 60 FCC 15B\_AVG 50 30 20 10 .15 .2 5 10 20 30 Frequency (MHz) : CO01-SZ Condition: FCC 15B QP LISN N 20140304 NEUTRAL Project : (FC) 551401 Mode : Mode 3 : 004402800006292 IMEI Over Limit Read LISN Cable Freq Level Limit Loss Remark Line Level Factor MHz dBu∀ dBu∀ dBu∀ 0.24 26.79 -25.38 52.17 16.20 0.34 10.25 Average 0.34 42.69 -19.48 62.17 10.25 QP 2 0.24 32.10 30.38 -20.82 51.20 3 0.27 19.80 0.35 10.23 Average 0.27 42.68 -18.52 61.20 32.10 0.35 10.23 QP 0.37 22.06 -26.46 48.52 11.50 0.37 35.76 -22.76 58.52 25.20 5 0.38 10.18 Average 10.18 QP 6 0.38 0.41 24.36 -23.37 47.73 13.80 0.39 10.17 Average 8 0.41 38.76 -18.97 57.73 28.20 0.39 10.17 QP 9 0.56 22.81 -23.19 46.00 12.30 0.36 10.15 Average 0.56 37.51 -18.49 56.00 27.00 10 \* 0.36 10.15 QP

0.64 21.04 -24.96 46.00 10.60

0.64 36.24 -19.76 56.00 25.80

11

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0.29 10.15 Average 0.29 10.15 QP

#### 3.2. Test of Radiated Emission Measurement

#### 3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance (meters) |  |  |
|--------------------|--------------------------------------|-------------------------------|--|--|
| 30 – 88            | 100                                  | 3                             |  |  |
| 88 – 216           | 150                                  | 3                             |  |  |
| 216 - 960          | 200                                  | 3                             |  |  |
| Above 960          | 500                                  | 3                             |  |  |

### 3.2.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.2.3. Test Procedures

- 1. The EUT was placed on a turntable with 0.8 meter above ground.
- 2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest radiation.
- 4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
- 6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
- 7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
- 8. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m)
- 9. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level

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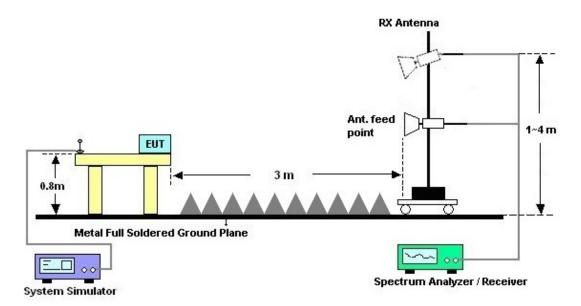
FCC Test Report No.: FC551401

## 3.2.4. Test Setup of Radiated Emission

### For radiated emissions from 30MHz to 1GHz

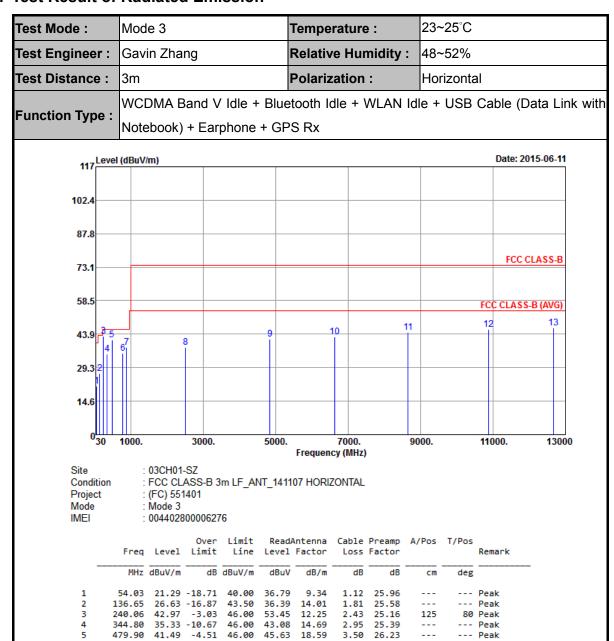


#### For radiated emissions above 1GHz



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#### 3.2.5. Test Result of Radiated Emission



46.00

46.00

46.00

74.00

74.00

74.00

74.00

74.00

74.00

35.61 -10.39

38.15 -7.85

38.28 -35.72

41.60 -32.40

42.59 -31.41

44.73 -29.27

45.95 -28.05

12662.00 46.48 -27.52

45.63

35.25

37.42

25.99

22.52

19.51

17.93

14.50

12.92

22.05

21.77

32.71

34.41

36.24

36.38

38.73

39.20

26.23

26.21

25.93

29.28

28.19

26.10

24.79

24.21

---

---

100

4.52

4.89

8.86

12.86

14.50

16.52

17.51

18.57

11

12

780.20

881.70

2510.00

4840.00

6636.00

8654.00

10872.00

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--- Peak

50 Peak



23~25°C Test Mode: Mode 3 Temperature: Test Engineer: Gavin Zhang **Relative Humidity:** 48~52% Polarization: Test Distance: 3m Vertical WCDMA Band V Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Function Type: Notebook) + Earphone + GPS Rx 117 Level (dBuV/m) Date: 2015-06-11 102.4 87.8 FCC CLASS-B 73.1 58.5 FCC CLASS-B (AVG) 13 43.9 29.3 14.6 1000. 3000. 9000. 11000. 13000 Frequency (MHz) Site : 03CH01-SZ Condition FCC CLASS-B 3m LF\_ANT\_141107 VERTICAL Project (FC) 551401 Mode Mode 3 IMFI : 004402800006276 Limit ReadAntenna Cable Preamp A/Pos T/Pos Remark Freq Level Limit Line Level Factor Loss Factor MHz dBuV/m dB dBuV/m dBuV dB/m dB cm deg 48.09 26.30 -13.70 40.00 40.48 10.74 1.06 25.98 --- Peak 43.50 43.50 28.50 -15.00 12.00 11.71 ------ Peak 166.08 39.93 2.00 25.43 31.85 -11.65 25.24 Peak 206.85 43.13 2.25 -9.80 0 Peak 36.20 46.00 40.34 18.59 26.23 100 762.00 33.40 -12.60 46.00 33.50 21.67 4.48 26.25 --- Peak 6 881.70 39.17 -6.83 46.00 38.44 21.77 4.89 25.93 --- Peak 37.40 960.10 38.41 -15.59 54.00 21.36 5.06 25.41 ------ Peak 42.55 -31.45 74.00 28.55 2974.00 33.07 9.85 28.92 --- Peak 4192.00 40.42 -33.58 74.00 Peak 22.66 34.02 12.19 28.45 10 6588.00 43.27 -30.73 74.00 20.30 36.27 14.45 27.75 Peak ---8696.00 43.84 - 30.16 74.00 16.86 36.44 16.61 26.07 --- Peak 10160.00 45.33 -28.67 74.00 14.53 38.23 12 17.76 25.19 Peak 46.27 -27.73 74.00 50 Peak 12714.00 12.67 39.17 18.63 24.20

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## 4. List of Measuring Equipment

| Instrument                        | Manufacturer            | Model No.                       | Serial No.       | Characteristics           | Calibration<br>Date | Test Date     | Due Date      | Remark                   |
|-----------------------------------|-------------------------|---------------------------------|------------------|---------------------------|---------------------|---------------|---------------|--------------------------|
| EMI Test<br>Receiver&SA           | Agilent<br>Technologies | N9038A                          | MY52260185       | 20Hz~26.5GHz              | May 26, 2015        | Jun. 11, 2015 | May 25, 2016  | Radiation<br>(03CH01-SZ) |
| Spectrum<br>Analyzer              | R&S                     | FSV40                           | 101041           | 10kHz~40GHz;<br>Max 30dBm | Sep. 25, 2014       | Jun. 11, 2015 | Sep. 24, 2015 | Radiation<br>(03CH01-SZ) |
| Bilog Antenna                     | TeseQ                   | CBL6112D                        | 23188            | 30MHz~2GHz                | Nov. 07, 2014       | Jun. 11, 2015 | Nov. 06, 2015 | Radiation<br>(03CH01-SZ) |
| Double Ridge<br>Horn Antenna      | ETS-Lindgren            | 3117                            | 00119436         | 1GHz~18GHz                | Oct. 15, 2014       | Jun. 11, 2015 | Oct. 14, 2015 | Radiation<br>(03CH01-SZ) |
| Amplifier                         | ADVANTEST               | BB525C                          | E9007003         | 9kHz~3000MHz<br>/ 30 dB   | Jan 28, 2015        | Jun. 11, 2015 | Jan 27, 2016  | Radiation<br>(03CH01-SZ) |
| Amplifier                         | Agilent<br>Technologies | 83017A                          | MY39501302       | 500MHz~26.5G<br>Hz        | Jan. 28, 2015       | Jun. 11, 2015 | Jan. 27, 2016 | Radiation<br>(03CH01-SZ) |
| Amplifier                         | Yiai                    | AV3860B                         | 04030            | 2GHz~26.5GHz              | May 05, 2015        | Jun. 11, 2015 | May 04, 2016  | Radiation<br>(03CH01-SZ) |
| EMI Receiver                      | R&S                     | ESCI7                           | 100724           | 9kHz~3GHz                 | Jan. 28, 2015       | May 18, 2015  | Jan. 27, 2016 | Conduction<br>(CO01-SZ)  |
| AC LISN                           | EMCO                    | 3816/2SH                        | 103892           | 9kHz~30MHz                | Feb. 02, 2015       | May 18, 2015  | Feb. 01, 2016 | Conduction<br>(CO01-SZ)  |
| AC LISN (for auxiliary equipment) | MessTec                 | AN3016                          | 16850            | 9kHz~30MHz                | Feb. 02, 2015       | May 18, 2015  | Feb. 01, 2016 | Conduction<br>(CO01-SZ)  |
| AC Power<br>Source                | Chroma                  | 61602                           | 61602000089<br>1 | 100Vac~250Vac             | Sep. 29, 2014       | May 18, 2015  | Sep. 28, 2015 | Conduction<br>(CO01-SZ)  |
| Pulse Limiter                     | COM-POWER               | LIT-153<br>Transient<br>Limiter | 53139            | 150kHz~30MHz              | Oct. 24, 2014       | May 18, 2015  | Oct. 23, 2015 | Conduction<br>(CO01-SZ)  |

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## 5. Uncertainty of Evaluation

### <u>Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)</u>

| Measuring Uncertainty for a Level of | 2 2 A D |  |  |
|--------------------------------------|---------|--|--|
| Confidence of 95% (U = 2Uc(y))       | 2.3dB   |  |  |

### <u>Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)</u>

| Managerian Unacetainty for a Lavel of | T     |
|---------------------------------------|-------|
| Measuring Uncertainty for a Level of  | 3.9dB |
| Confidence of 95% (U = 2Uc(y))        | 0.5dB |

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