

# RF TEST REPORT



Report No.: 15070952-FCC-R1

Supersede Report No.: N/A

|  |  |  |
|--|--|--|
| Applicant  | Sun Cupid Technology (HK) Ltd.   |  |
| Product Name   | Moblie phone   |  |
| Model No.  | F1   |  |
| Serial No.   | N/A  |  |
| Test Standard  | FCC Part 22(H), FCC Part 24(E),ANSI/TIAC603 D: 2010                    |  |
| Test Date  | October 17 to October 31, 2015   |  |
| Issue Date   | October 31, 2015   |  |
| Test Result  | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |  |
| Equipment complied with the specification <input checked="" type="checkbox"/>  |  |  |
| Equipment did not comply with the specification <input type="checkbox"/>   |  |  |
| <i>Winnie Zhang</i>  | <i>David Huang</i>   |  |
| Winnie Zhang<br>Test Engineer  | David Huang<br>Checked By  |  |
| This test report may be reproduced in full only<br>Test result presented in this test report is applicable to the tested sample only |  |  |

Issued by:

**SIEMIC (SHENZHEN-CHINA) LABORATORIES**

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## Laboratories Introduction

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### Accreditations for Conformity Assessment

| Country/Region | Scope                              |
|----------------|------------------------------------|
| USA            | EMC, RF/Wireless, SAR, Telecom     |
| Canada         | EMC, RF/Wireless, SAR, Telecom     |
| Taiwan         | EMC, RF, Telecom, SAR, Safety      |
| Hong Kong      | RF/Wireless, SAR, Telecom          |
| Australia      | EMC, RF, Telecom, SAR, Safety      |
| Korea          | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan          | EMI, RF/Wireless, SAR, Telecom     |
| Singapore      | EMC, RF, SAR, Telecom              |
| Europe         | EMC, RF, SAR, Telecom, Safety      |

|             |                 |
|-------------|-----------------|
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## 1. Report Revision History

| Report No.      | Report Version | Description | Issue Date       |
|-----------------|----------------|-------------|------------------|
| 15070952-FCC-R1 | NONE           | Original    | October 31, 2015 |
|                 |                |             |                  |
|                 |                |             |                  |
|                 |                |             |                  |
|                 |                |             |                  |
|                 |                |             |                  |

## 2. Customer information

|                  |  |
|------------------|--|
| Applicant Name   | Sun Cupid Technology (HK) Ltd.   |
| Applicant Add    | 16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon                          |
| Manufacturer     | SUNCUPID (SHENZHEN) ELECTRONIC LTD   |
| Manufacturer Add | Baolong Industrial City, Longgang District, Shenzhen Hi-Tech Road, Building 1, A 7 |

## 3. Test site information

|                      |  |
|----------------------|--|
| Lab performing tests | SIEMIC (Shenzhen-China) LABORATORIES   |
| Lab Address          | Zone A, Floor 1, Building 2 Wan Ye Long Technology Park<br>South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China<br>518108 |
| FCC Test Site No.    | 718246   |
| IC Test Site No.     | 4842E-1  |
| Test Software        | Radiated Emission Program-To Shenzhen v2.0   |

## 4. Equipment under Test (EUT) Information

|   |   |
|---|---|
| Description of EUT:                       | Moblie phone  |
| Main Model:                               | F1  |
| Serial Model:                             | N/A   |
| Date EUT received:                        | October 16, 2015  |
| Test Date(s):                             | October 17 to October 31, 2015  |
| Equipment Category :                      | PCE   |
| Antenna Gain:                             | GSM850: 0.8dBi<br>PCS1900: 0.5dBi<br>Bluetooth: -1.0dBi   |
| Type of Modulation:                       | GSM / GPRS: GMSK<br>Bluetooth: GFSK, $\pi$ /4DQPSK, 8DPSK   |
| RF Operating Frequency (ies):             | GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz<br>PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz<br>Bluetooth: 2402-2480 MHz |
| Maximum Conducted<br>AV Power to Antenna: | GSM850: 32.49 dBm<br>PCS1900: 30.31 dBm   |
| ERP/EIRP:                                 | GSM850: 31.30 dBm / ERP<br>PCS1900: 30.70 dBm / EIRP  |
| Number of Channels:                       | GSM 850: 124CH<br>PCS1900: 299CH<br>Bluetooth: 79CH   |
| Port:                                     | Power Port, Earphone Port, USB Port   |
| Input Power:                              | Adapter:  |

|             |                 |
|-------------|-----------------|
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Model:K002-05050U

Input: AC 100-240V, 50/60Hz, 0.2A

Output: DC 5.0V, 0.5A

Battery:

Model:BL-4C

Spec: 3.7V, 600mAh, 2.22Wh

Trade Name :

NUU

GPRS Multi-slot class

8/10/12

FCC ID:

2ADINNUUF1

## 5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

| FCC Rules                                 | Description of Test  | Result     |
|---|--|------------|
| § 1.1307; § 2.1093                        | RF Exposure (SAR)  | Compliance |
| §2.1046; § 22.913(a); § 24.232(c)         | RF Output Power  | Compliance |
| § 24.232 (d)                              | Peak-Average Ratio   | Compliance |
| § 2.1047                                  | Modulation Characteristics   | Compliance |
| § 2.1049; § 22.905; § 22.917;<br>§ 24.238 | 99% & -26 dB Occupied Bandwidth  | Compliance |
| § 2.1051; § 22.917(a);<br>§ 24.238(a)     | Spurious Emissions at Antenna Terminal                                 | Compliance |
| § 2.1053; § 22.917(a);<br>§ 24.238(a)     | Field Strength of Spurious Radiation                                   | Compliance |
| § 22.917(a); § 24.238(a)                  | Out of band emission, Band Edge  | Compliance |
| § 2.1055; § 22.355; § 24.235              | Frequency stability vs. temperature<br>Frequency stability vs. voltage | Compliance |

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

### Measurement Uncertainty

| Emissions                                    |   |               |
|--|---|---------------|
| Test Item                                    | Description   | Uncertainty   |
| Band Edge and Radiated<br>Spurious Emissions | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | +5.6dB/-4.5dB |
| -  | -   | -             |



## **6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS**

### **6.1 RF Exposure (SAR)**

Test Result: Pass

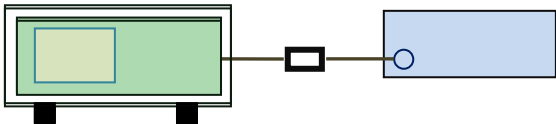
The EUT is a portable device, thus requires SAR evaluation;  
Please refer to RF Exposure Evaluation Report: 15070952-FCC-H.

## 6.2 RF Output Power

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

### Requirement(s):

| Spec        | Item | Requirement  | Applicable                          |
|-------------|------|--------------|-------------------------------------|
| §22.913 (a) | a)   | ERP:38.45dBm | <input checked="" type="checkbox"/> |
| §24.232 (c) | b)   | EIRP:33dBm   | <input checked="" type="checkbox"/> |

|                |  |
|----------------|--|
| Test Setup     |   |
| Test Procedure | <p>For Conducted Power:</p> <ul style="list-style-type: none"> <li>- The transmitter output port was connected to base station.</li> <li>- Set EUT at maximum power through base station.</li> <li>- Select lowest, middle, and highest channels for each band and different test mode.</li> </ul> <p>For ERP/EIRP:</p> <ul style="list-style-type: none"> <li>- The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.</li> <li>- The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.</li> <li>- The frequency range up to tenth harmonic of the fundamental frequency was investigated.</li> <li>- Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-</li> </ul> |

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|        |   |
|--------|---|
|        | <p>radiating cable. The absolute levels of the spurious emissions were measured by the substitution.</p> <ul style="list-style-type: none"> <li>- Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level</li> <li>- Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts).</li> </ul> |
| Remark |   |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail  |

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

## Conducted Power

### GSM Mode:

| Burst Average Power (dBm);   |              |       |       |                              |              |       |        |                              |
|--|--------------|-------|-------|------------------------------|--------------|-------|--------|------------------------------|
| Band   | GSM850       |       |       |                              | PCS1900      |       |        |                              |
| Channel  | 128          | 190   | 251   | Tune up<br>Power<br>tolerant | 512          | 661   | 810    | Tune up<br>Power<br>tolerant |
| Frequency (MHz)  | 824.2        | 836.6 | 848.8 | /                            | 1850.2       | 1880  | 1909.8 | /                            |
| GSM Voice<br>(1 uplink),GMSK   | <b>32.49</b> | 32.5  | 32.46 | 32±1                         | <b>30.31</b> | 30.09 | 29.96  | 30±1                         |
| GPRS Multi-Slot Class<br>8 (1 uplink),GMSK   | 32.47        | 32.43 | 32.44 | 32±1                         | 29.65        | 29.47 | 29.61  | 29±1                         |
| GPRS Multi-Slot Class<br>10 (2 uplink) GMSK  | 31.97        | 32.13 | 32.16 | 32±1                         | 29.24        | 29.20 | 29.35  | 29±1                         |
| Remark :<br>GPRS, CS1 coding scheme.<br>Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link<br>Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link<br>Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link |              |       |       |                              |              |       |        |                              |

**Note:** Since GSM mode has higher power, so the test items below were not performed to GPRS mode.

## UMTS Mode:

### ERP & EIRP

#### ERP for Cellular Band (Part 22H)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|-----------------|-------------------------|----------------------|-------------------------------|-----------------|----------------------|-------------|
| 824.2           | 25.02                   | V                    | 6.8                           | 0.53            | 31.29                | 38.45       |
| 824.2           | 24.18                   | H                    | 6.8                           | 0.53            | 30.45                | 38.45       |
| 836.6           | 24.89                   | V                    | 6.8                           | 0.53            | 31.16                | 38.45       |
| 836.6           | 24.06                   | H                    | 6.8                           | 0.53            | 30.33                | 38.45       |
| 848.8           | 24.93                   | V                    | 6.9                           | 0.53            | <b>31.30</b>         | 38.45       |
| 848.8           | 24.05                   | H                    | 6.9                           | 0.53            | 30.42                | 38.45       |

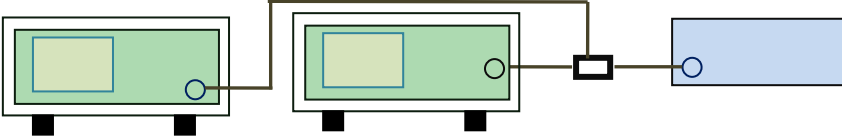
#### EIRP for PCS Band (Part 24E)

| Frequency (MHz) | Substituted level (dBm) | Antenna Polarization | Antenna Gain correction (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) |
|-----------------|-------------------------|----------------------|-------------------------------|-----------------|----------------------|-------------|
| 1850.2          | 22.61                   | V                    | 7.88                          | 0.85            | 29.64                | 33          |
| 1850.2          | 21.83                   | H                    | 7.88                          | 0.85            | 28.86                | 33          |
| 1880            | 23.34                   | V                    | 7.88                          | 0.85            | 30.37                | 33          |
| 1880            | 22.61                   | H                    | 7.88                          | 0.85            | 29.64                | 33          |
| 1909.8          | 23.69                   | V                    | 7.86                          | 0.85            | <b>30.70</b>         | 33          |
| 1909.8          | 22.85                   | H                    | 7.86                          | 0.85            | 29.86                | 33          |

### 6.3 Peak-Average Ratio

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

Requirement(s):

| Spec           | Item   | Requirement   | Applicable                          |
|----------------|--|---|-------------------------------------|
| §24.232(d)     | a)   | The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB. | <input checked="" type="checkbox"/> |
| Test Setup     |   |   |                                     |
| Test Procedure | <p><b>According with KDB 971168</b></p> <ol style="list-style-type: none"> <li>1. The signal analyzer' s CCDF measurement profile is enabled</li> <li>2. Frequency = carrier center frequency</li> <li>3. Measurement BW &gt; Emission bandwidth of signal</li> <li>4. The signal analyzer was set to collect one million samples to generate the CCDF curve</li> <li>5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (&gt;98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal “ RF Burst” trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the “ on time” of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power</li> </ol> |   |                                     |
| Remark         |  |   |                                     |
| Result         | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail   |   |                                     |

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

## PCS1900

| Frequency<br>(MHz) | Conducted power(dBm) |         | Peak-Average<br>Ratio(PAR) |
|--------------------|----------------------|---------|----------------------------|
|                    | Peak                 | Average |                            |
| 1850.2             | 31.63                | 29.96   | 1.67                       |
| 1880               | 31.59                | 30.09   | 1.50                       |
| 1909.8             | 31.52                | 30.31   | 1.21                       |

## 6.4 Modulation Characteristic

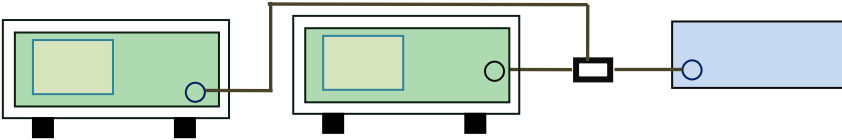
According to FCC § 2.1047(d), Part 22H, 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.



## 6.5 Occupied Bandwidth

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

### Requirement(s):

| Spec                                       | Item   | Requirement                 | Applicable                          |
|--|--|-----------------------------|-------------------------------------|
| §2.1049,<br>§22.917,<br>§22.905<br>§24.238 | a)   | 99% Occupied Bandwidth(kHz) | <input checked="" type="checkbox"/> |
|  | b)   | 26 dB Bandwidth(kHz)        | <input checked="" type="checkbox"/> |
| Test Setup                                 |    |                             |                                     |
| Test Procedure                             | <ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.</li> </ul> |                             |                                     |
| Remark                                     |  |                             |                                     |
| Result                                     | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail   |                             |                                     |

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

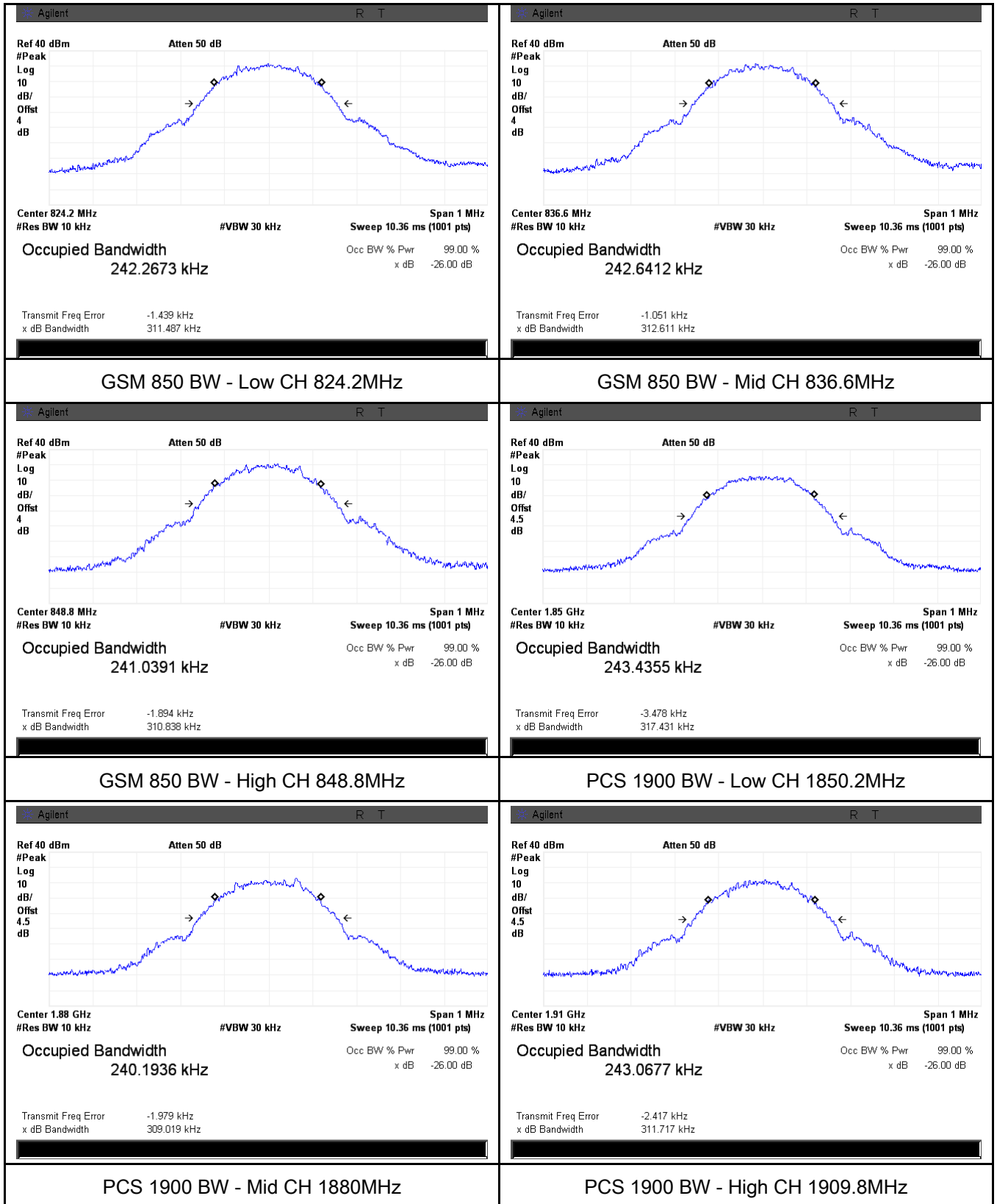
### Cellular Band (Part 22H) result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---------|-----------------|------------------------------|-----------------------|
| 128     | 824.2           | 242.2673                     | 311.487               |
| 190     | 836.6           | 242.6412                     | 312.611               |
| 251     | 848.8           | 241.0391                     | 310.838               |

### PCS Band (Part 24E) result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26 dB Bandwidth (kHz) |
|---------|-----------------|------------------------------|-----------------------|
| 512     | 1850.2          | 243.4355                     | 317.431               |
| 661     | 1880.0          | 240.1936                     | 309.019               |
| 810     | 1909.8          | 243.0677                     | 311.717               |

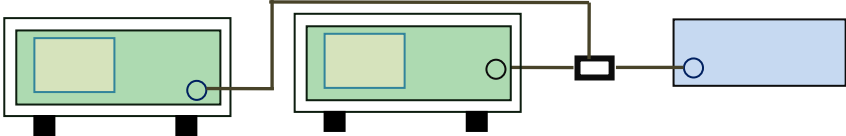
## Test Plots



## 6.6 Spurious Emissions at Antenna Terminals

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

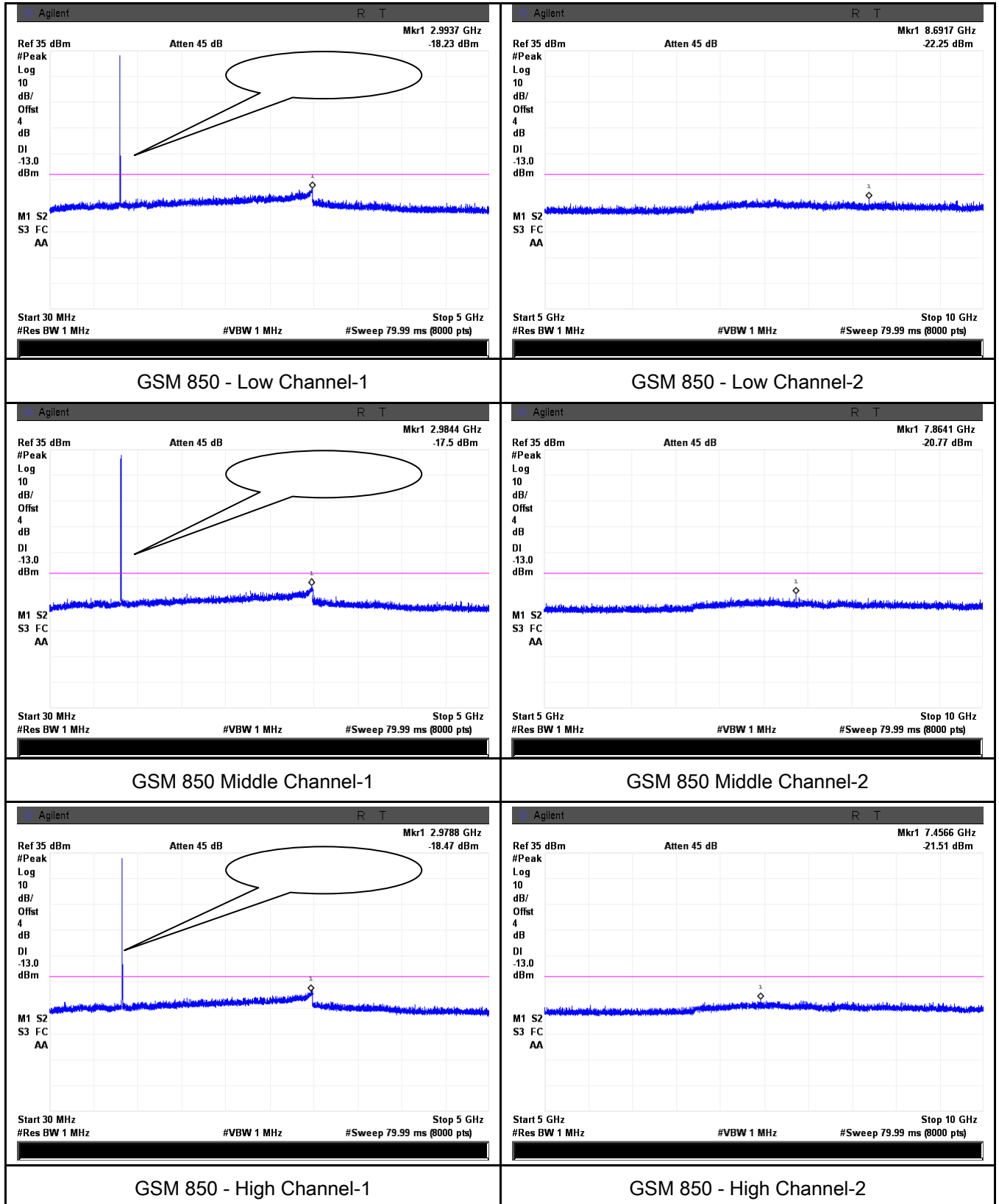
### Requirement(s):

| Spec                                  | Item   | Requirement   | Applicable                          |
|---------------------------------------|--|---|-------------------------------------|
| §2.1051,<br>§22.917(a)&<br>§24.238(a) | a)   | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB | <input checked="" type="checkbox"/> |
| Test Setup                            |    |   |                                     |
| Test Procedure                        | <ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured.</li> <li>- Setting RBW as roughly BW/100.</li> </ul> |   |                                     |
| Remark                                |  |   |                                     |
| Result                                | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail   |   |                                     |

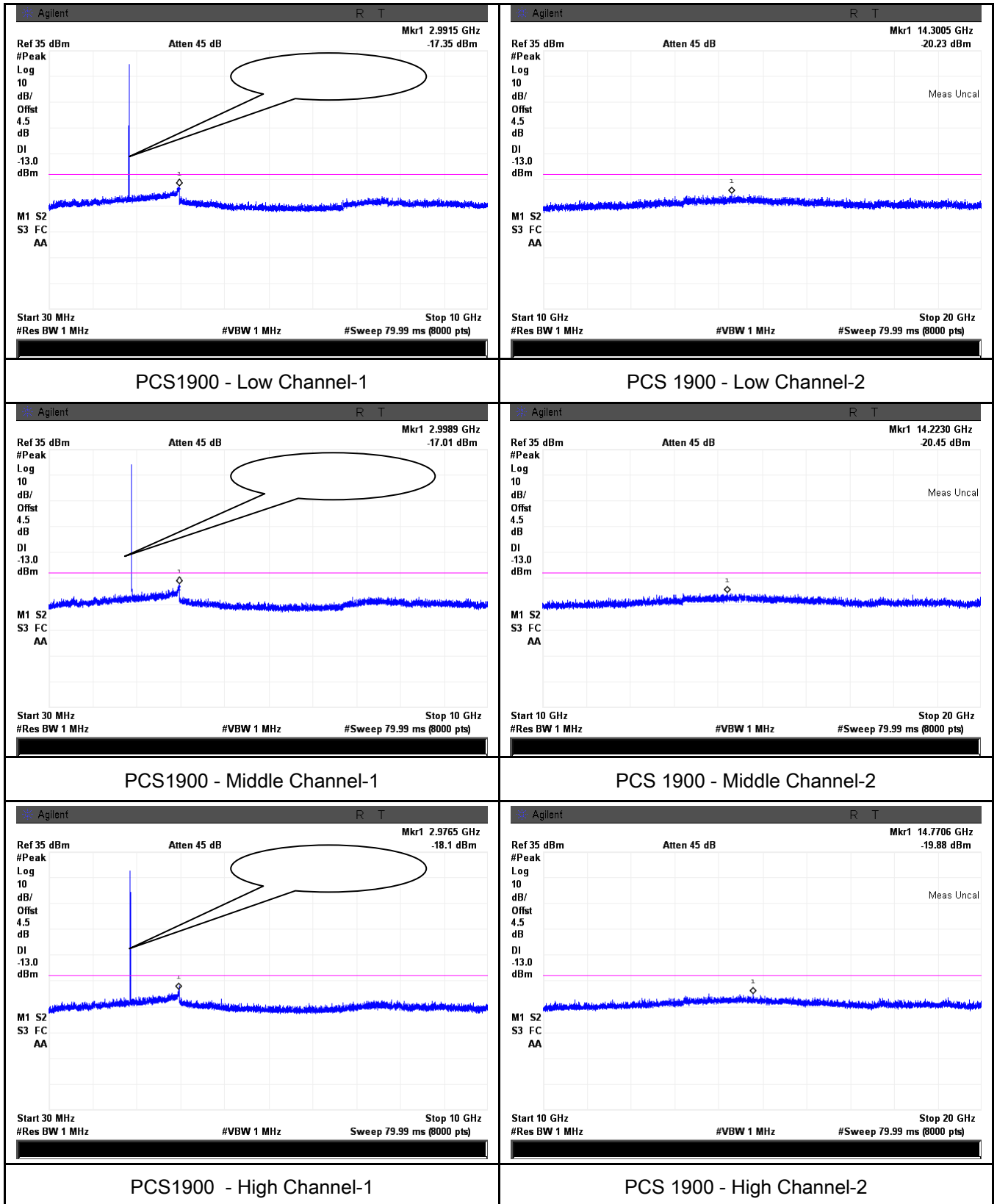
Test Data    ☒ Yes      ☐ N/A  
 Test Plot    ☒ Yes (See below)      ☐ N/A

## Test Plots

### Cellular Band (Part 22H) result



## PCS Band (Part24E) result



## 6.7 Spurious Radiated Emissions

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

### Requirement(s):

| Spec                             | Item | Requirement   | Applicable                          |
|----------------------------------|------|---|-------------------------------------|
| §2.1053,<br>§22.917 &<br>§24.238 | a)   | 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. | <input checked="" type="checkbox"/> |

|            |  |
|------------|--|
| Test setup |  |
|------------|--|

|                |   |
|----------------|---|
| Test Procedure | <ol style="list-style-type: none"> <li>The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.</li> <li>The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.</li> <li>Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.</li> </ol> <p>Sample Calculation:</p> <p>EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)</p> |
|----------------|---|

|        |  |
|--------|--|
| Remark |  |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

### Cellular Band (Part 22H) result

#### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|-------------------------|----------------|------------------------------|-----------------|-------------------------|-------------|-------------|
| 1648.4          | -45.81                  | V              | 7.95                         | 0.78            | -38.64                  | -13         | -25.64      |
| 1648.4          | -46.28                  | H              | 7.95                         | 0.78            | -39.11                  | -13         | -26.11      |
| 49.1            | -35.62                  | V              | -4.9                         | 0.11            | -40.63                  | -13         | -27.63      |
| 110.5           | -39.34                  | H              | -1.6                         | 0.17            | -41.11                  | -13         | -28.11      |

#### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|-------------------------|----------------|------------------------------|-----------------|-------------------------|-------------|-------------|
| 1673.2          | -45.76                  | V              | 7.95                         | 0.78            | -38.59                  | -13         | -25.59      |
| 1673.2          | -46.13                  | H              | 7.95                         | 0.78            | -38.96                  | -13         | -25.96      |
| 49.5            | -35.57                  | V              | -4.9                         | 0.11            | -40.58                  | -13         | -27.58      |
| 110.8           | -39.41                  | H              | -1.6                         | 0.17            | -41.18                  | -13         | -28.18      |

#### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|-------------------------|----------------|------------------------------|-----------------|-------------------------|-------------|-------------|
| 1697.6          | -45.77                  | V              | 7.95                         | 0.78            | -38.6                   | -13         | -25.60      |
| 1697.6          | -46.15                  | H              | 7.95                         | 0.78            | -38.98                  | -13         | -25.98      |
| 49.3            | -35.49                  | V              | -4.9                         | 0.11            | -40.50                  | -13         | -27.50      |



|             |                 |
|-------------|-----------------|
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|       |        |   |      |      |        |     |        |
|-------|--------|---|------|------|--------|-----|--------|
| 110.2 | -39.45 | H | -1.6 | 0.17 | -41.22 | -13 | -28.22 |
|-------|--------|---|------|------|--------|-----|--------|

## PCS Band (Part24E) result

### Low channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|-------------------------|----------------|------------------------------|-----------------|-------------------------|-------------|-------------|
| 3700.4          | -47.95                  | V              | 10.25                        | 2.73            | -40.43                  | -13         | -27.43      |
| 3700.4          | -48.69                  | H              | 10.25                        | 2.73            | -41.17                  | -13         | -28.17      |
| 49.5            | -35.82                  | V              | -4.9                         | 0.11            | -40.83                  | -13         | -27.83      |
| 110.7           | -39.75                  | H              | -1.6                         | 0.17            | -41.52                  | -13         | -28.52      |

### Middle channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|-------------------------|----------------|------------------------------|-----------------|-------------------------|-------------|-------------|
| 3760            | -47.91                  | V              | 10.25                        | 2.73            | -40.39                  | -13         | -27.39      |
| 3760            | -48.75                  | H              | 10.25                        | 2.73            | -41.23                  | -13         | -28.23      |
| 49.6            | -35.99                  | V              | -4.9                         | 0.11            | -41.00                  | -13         | -28.00      |
| 110.1           | -39.82                  | H              | -1.6                         | 0.17            | -41.59                  | -13         | -28.59      |

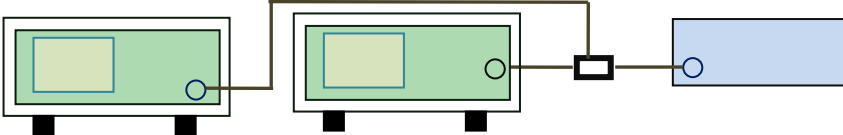
### High channel

| Frequency (MHz) | Substituted level (dBm) | Polarity (H/V) | Antenna Gain Correction (dB) | Cable Loss (dB) | Corrected Reading (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|-------------------------|----------------|------------------------------|-----------------|-------------------------|-------------|-------------|
| 3819.6          | -47.88                  | V              | 10.36                        | 2.73            | -40.25                  | -13         | -27.25      |
| 3819.6          | -48.73                  | H              | 10.36                        | 2.73            | -41.10                  | -13         | -28.10      |
| 49.8            | -35.91                  | V              | -4.9                         | 0.11            | -40.92                  | -13         | -27.92      |
| 110.5           | -39.87                  | H              | -1.6                         | 0.17            | -41.64                  | -13         | -28.64      |

## 6.8 Band Edge

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

### Requirement(s):

| Spec                     | Item  | Requirement  | Applicable                          |
|--------------------------|---|--|-------------------------------------|
| §22.917(a)<br>§24.238(a) | a)  | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. | <input checked="" type="checkbox"/> |
| Test setup               |   |  |                                     |
| Procedure                | <ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.</li> </ul> |  |                                     |
| Remark                   |   |  |                                     |
| Result                   | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail  |  |                                     |

Test Data    ☒ Yes      ☐ N/A

Test Plot    ☒ Yes (See below)      ☐ N/A

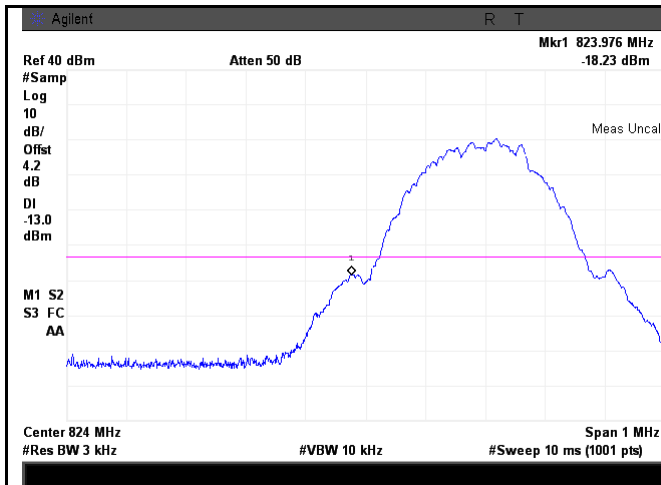
### Cellular Band (Part 22H) result

| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 823.976         | -18.23         | -13         |
| 849.002         | -17.10         | -13         |

### PCS Band (Part 24E) result

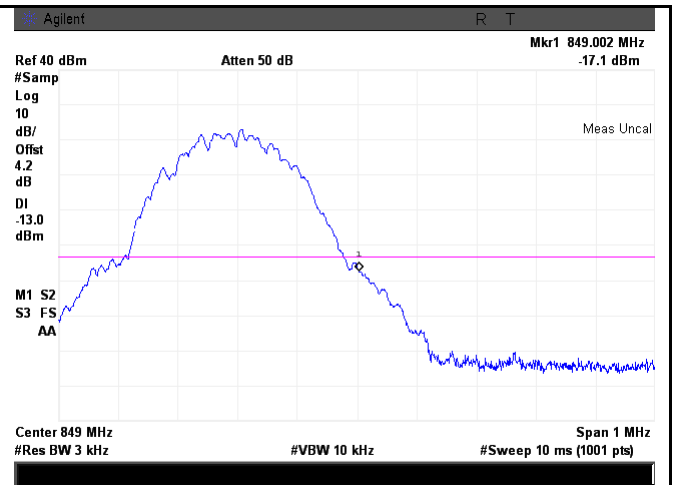
| Frequency (MHz) | Emission (dBm) | Limit (dBm) |
|-----------------|----------------|-------------|
| 1850.0000       | -15.55         | -13         |
| 1910.0200       | -14.24         | -13         |

## Test Plots



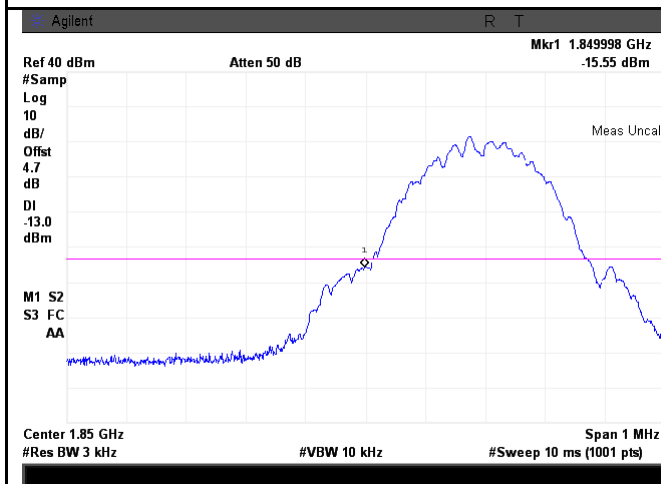
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log  
(3.11/3)=4.0+0.2=4.2 dB



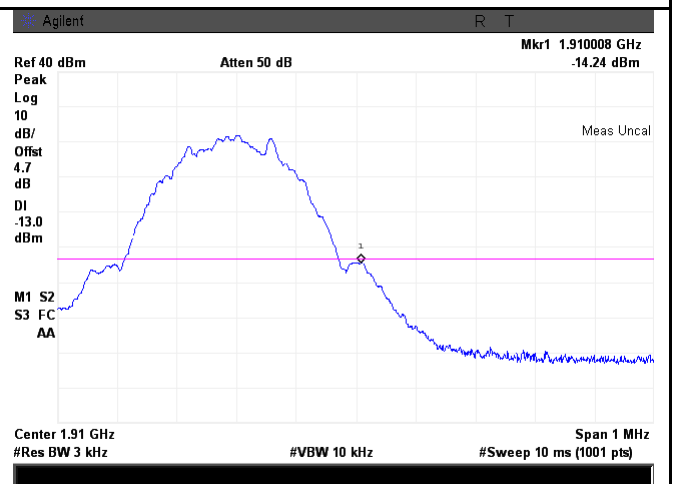
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log  
(3.10/3)=4.0+0.2=4.2 dB



PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log  
(3.17/3)=4.5+0.2=4.7 dB



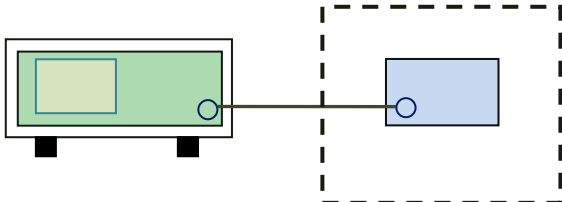
PCS Band - High Channel

Note: Offset=Cable loss (4.5) + 10log  
(3.11/3)=4.5+0.2=4.7 dB

## 6.9 Frequency Stability

|                      |                  |
|----------------------|------------------|
| Temperature          | 25°C             |
| Relative Humidity    | 52%              |
| Atmospheric Pressure | 1028mbar         |
| Test date :          | October 28, 2015 |
| Tested By :          | Winnie Zhang     |

### Requirement(s):

| Spec                             | Item   | Requirement   | Applicable             |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
|----------------------------------|--|---|------------------------|-------------------|------------------------|------------------------|----------|------|------|------|----------|-----|-----|------|------------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|--------------|------|-----|-----|-------------------------------------|
| §2.1055,<br>§22.355 &<br>§24.235 | a)   | <p>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr> </thead> <tbody> <tr> <td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr> <tr> <td>5 to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr> <tr> <td>450 to 512</td><td>2.5</td><td>5.0</td><td>5.0</td></tr> <tr> <td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>928 to 929</td><td>5.0</td><td>N/A</td><td>N/A</td></tr> <tr> <td>929 to 960</td><td>1.5</td><td>N/A</td><td>N/A</td></tr> <tr> <td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p> | Frequency Range (MHz)  | Base, fixed (ppm) | Mobile ≤ 3 watts (ppm) | Mobile ≤ 3 watts (ppm) | 25 to 50 | 20.0 | 20.0 | 50.0 | 5 to 450 | 5.0 | 5.0 | 50.0 | 450 to 512 | 2.5 | 5.0 | 5.0 | 821 to 896 | 1.5 | 2.5 | 2.5 | 928 to 929 | 5.0 | N/A | N/A | 929 to 960 | 1.5 | N/A | N/A | 2110 to 2220 | 10.0 | N/A | N/A | <input checked="" type="checkbox"/> |
| Frequency Range (MHz)            | Base, fixed (ppm)  | Mobile ≤ 3 watts (ppm)  | Mobile ≤ 3 watts (ppm) |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 25 to 50                         | 20.0   | 20.0  | 50.0                   |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 5 to 450                         | 5.0  | 5.0   | 50.0                   |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 450 to 512                       | 2.5  | 5.0   | 5.0                    |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 821 to 896                       | 1.5  | 2.5   | 2.5                    |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 928 to 929                       | 5.0  | N/A   | N/A                    |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 929 to 960                       | 1.5  | N/A   | N/A                    |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| 2110 to 2220                     | 10.0   | N/A   | N/A                    |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |
| Test setup                       |  |   |                        |                   |                        |                        |          |      |      |      |          |     |     |      |            |     |     |     |            |     |     |     |            |     |     |     |            |     |     |     |              |      |     |     |                                     |

|             |                 |
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|           |  |
|-----------|--|
| Procedure | A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.<br>Limit: The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ( $\pm 2.5\text{ppm}$ ) of the center frequency. |
| Remark    |  |
| Result    | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail   |

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

### Cellular Band (Part 22H) result

| Middle Channel, $f_0 = 836.6$ MHz |                                   |                      |                       |             |
|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supplied (V <sub>DC</sub> ) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10                               | 3.7                               | 20                   | 0.0106                | 2.5         |
| 0                                 |                                   | 21                   | 0.0112                | 2.5         |
| 10                                |                                   | 20                   | 0.0106                | 2.5         |
| 20                                |                                   | 16                   | 0.0085                | 2.5         |
| 30                                |                                   | 15                   | 0.0080                | 2.5         |
| 40                                |                                   | 19                   | 0.0101                | 2.5         |
| 50                                |                                   | 20                   | 0.0106                | 2.5         |
| 55                                |                                   | 23                   | 0.0122                | 2.5         |
| 25                                | 4.2                               | 21                   | 0.0112                | 2.5         |
|                                   | 3.5                               | 21                   | 0.0112                | 2.5         |

### PCS Band (Part 24E) result

| Middle Channel, $f_0 = 1880$ MHz |                                   |                      |                       |             |
|----------------------------------|-----------------------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                 | Power Supplied (V <sub>DC</sub> ) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| -10                              | 3.7                               | 22                   | 0.0263                | 2.5         |
| 0                                |                                   | 21                   | 0.0251                | 2.5         |
| 10                               |                                   | 22                   | 0.0263                | 2.5         |
| 20                               |                                   | 17                   | 0.0203                | 2.5         |
| 30                               |                                   | 16                   | 0.0191                | 2.5         |
| 40                               |                                   | 20                   | 0.0239                | 2.5         |
| 50                               |                                   | 16                   | 0.0191                | 2.5         |
| 55                               |                                   | 24                   | 0.0287                | 2.5         |
| 25                               | 4.2                               | 25                   | 0.0299                | 2.5         |
|                                  | 3.5                               | 21                   | 0.0251                | 2.5         |



## Annex A. TEST INSTRUMENT

| Instrument                             | Model           | Serial #   | Cal Date   | Cal Due    | In use                              |
|--|-----------------|------------|------------|------------|-------------------------------------|
| <b>RF Conducted Test</b>               |                 |            |            |            |                                     |
| Agilent ESA-E SERIES SPECTRUM ANALYZER | E4407B          | MY45108319 | 09/16/2015 | 09/15/2016 | <input checked="" type="checkbox"/> |
| Power Splitter                         | 1#              | 1#         | 09/01/2015 | 08/31/2016 | <input checked="" type="checkbox"/> |
| Universal Radio Communication Tester   | CMU200          | 121393     | 09/25/2015 | 09/24/2016 | <input checked="" type="checkbox"/> |
| Temperature/Humidity Chamber           | UHL-270         | 001        | 10/09/2015 | 10/08/2016 | <input checked="" type="checkbox"/> |
| DC Power Supply                        | E3640A          | MY40004013 | 09/17/2015 | 09/16/2016 | <input checked="" type="checkbox"/> |
| <b>Radiated Emissions</b>              |                 |            |            |            |                                     |
| EMI test receiver                      | ESL6            | 100262     | 09/17/2015 | 09/16/2016 | <input checked="" type="checkbox"/> |
| OPT 010 AMPLIFIER (0.1-1300MHz)        | 8447E           | 2727A02430 | 09/01/2015 | 08/31/2016 | <input checked="" type="checkbox"/> |
| Microwave Preamplifier (1 ~ 26.5GHz)   | 8449B           | 3008A02402 | 03/25/2015 | 03/24/2016 | <input checked="" type="checkbox"/> |
| Bilog Antenna (30MHz~6GHz)             | JB6             | A110712    | 09/21/2015 | 09/20/2016 | <input checked="" type="checkbox"/> |
| Bilog Antenna (30MHz~2GHz)             | JB1             | A112017    | 09/21/2015 | 09/20/2016 | <input checked="" type="checkbox"/> |
| Double Ridge Horn Antenna (1 ~18GHz)   | AH-118          | 71259      | 09/24/2015 | 09/23/2016 | <input checked="" type="checkbox"/> |
| Double Ridge Horn Antenna (1 ~18GHz)   | AH-118          | 71283      | 09/24/2015 | 09/23/2016 | <input checked="" type="checkbox"/> |
| SYNTHESIZED SIGNAL GENERATOR           | 8665B           | 3744A01293 | 09/17/2015 | 09/16/2016 | <input checked="" type="checkbox"/> |
| Tunable Notch Filter                   | 3NF-800/1000-S  | AA4        | 09/01/2015 | 08/31/2016 | <input checked="" type="checkbox"/> |
| Tunable Notch Filter                   | 3NF-1000/2000-S | AM 4       | 09/01/2015 | 08/31/2016 | <input checked="" type="checkbox"/> |

## Annex B. EUT And Test Setup Photographs

### Annex B.i. Photograph: EUT External Photo







EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View



**Annex B.ii. Photograph: EUT Internal Photo**



Cover Off - Top View 1



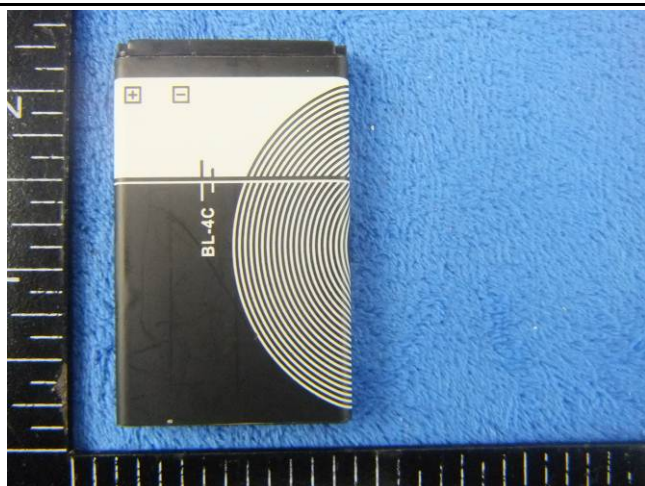
Cover Off - Top View 2



Cover Off - Top View 3



Cover Off - Top View 4



Battery - Top View

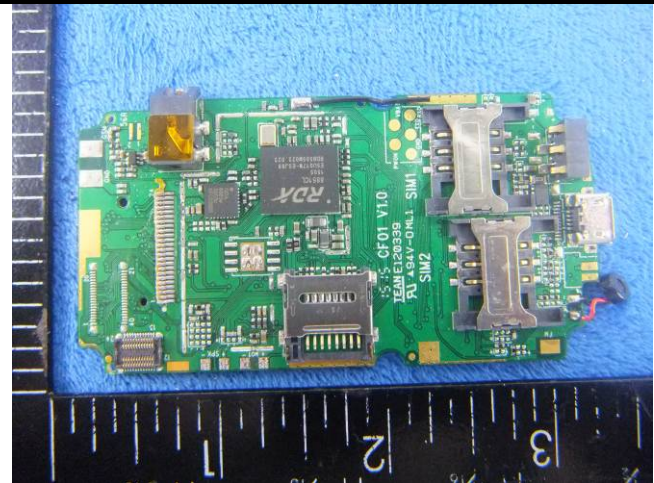


Battery - Bottom View

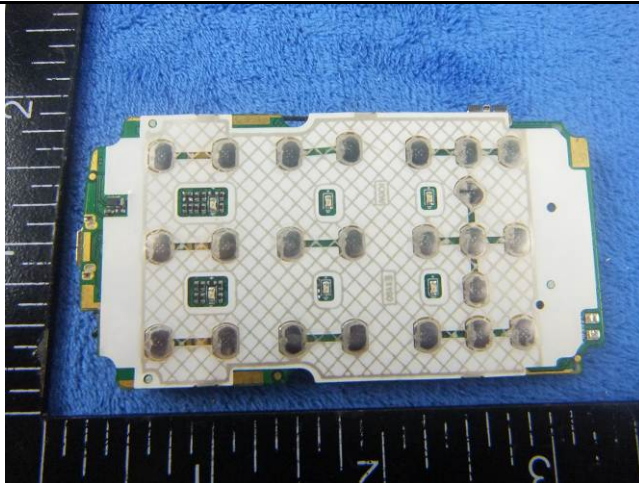




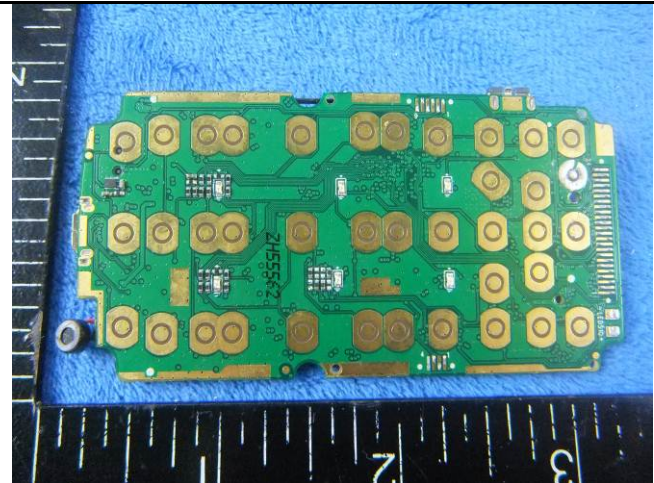
Mainboard With Shielding - Front View



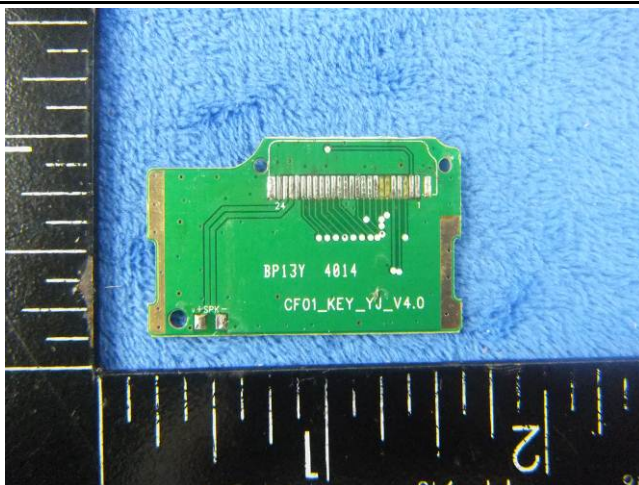
Mainboard Without Shielding - Front View



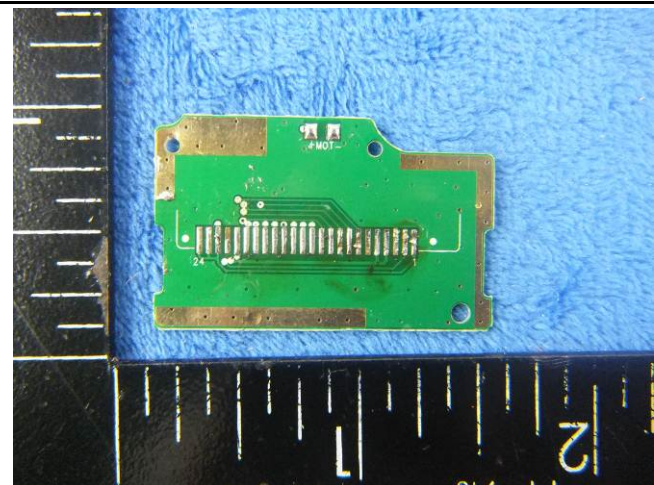
Mainboard With Button Cover - Rear View



Mainboard Without Button Cover - Rear View

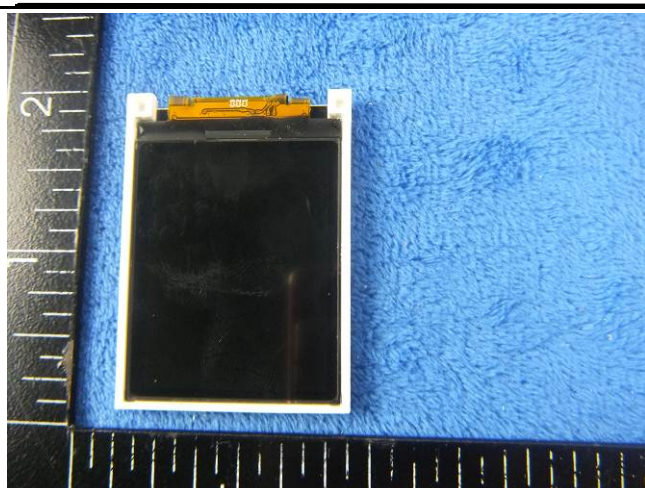


Small board - Front View

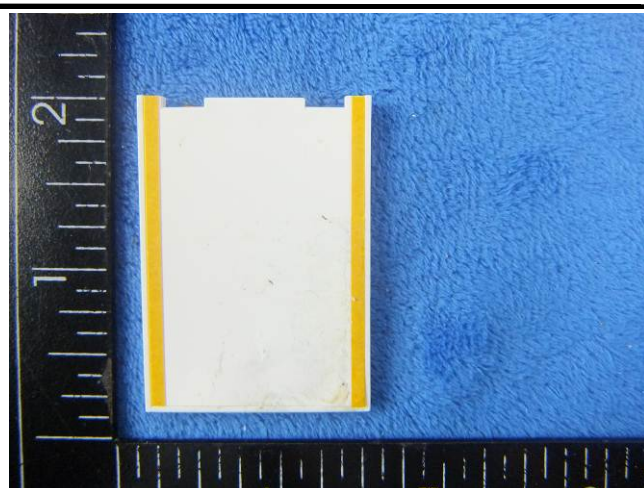


Small board - Rear View

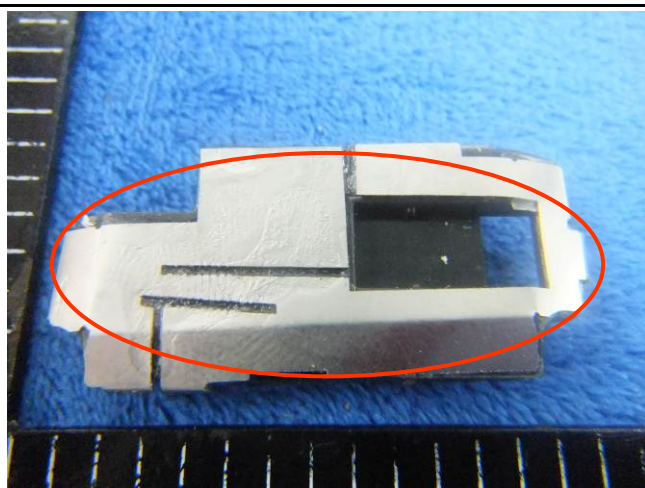




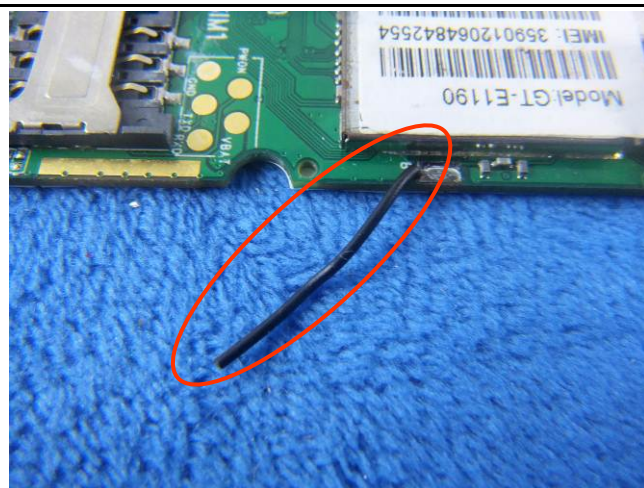
LCD – Front View



LCD – Rear View

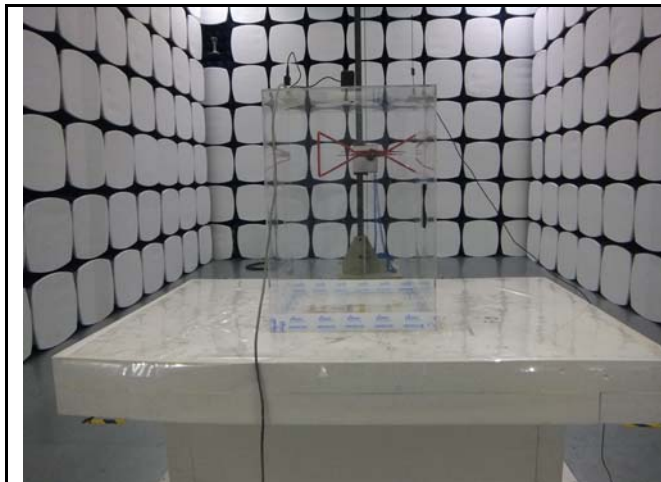


GSM/PCS Antenna View

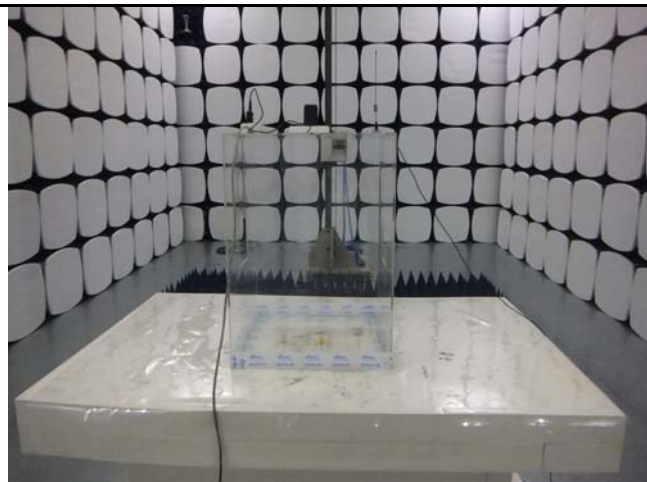


BT - Antenna View

**Annex B.iii. Photograph: Test Setup Photo**



Radiated Spurious Emissions Test Setup Below 1GHz

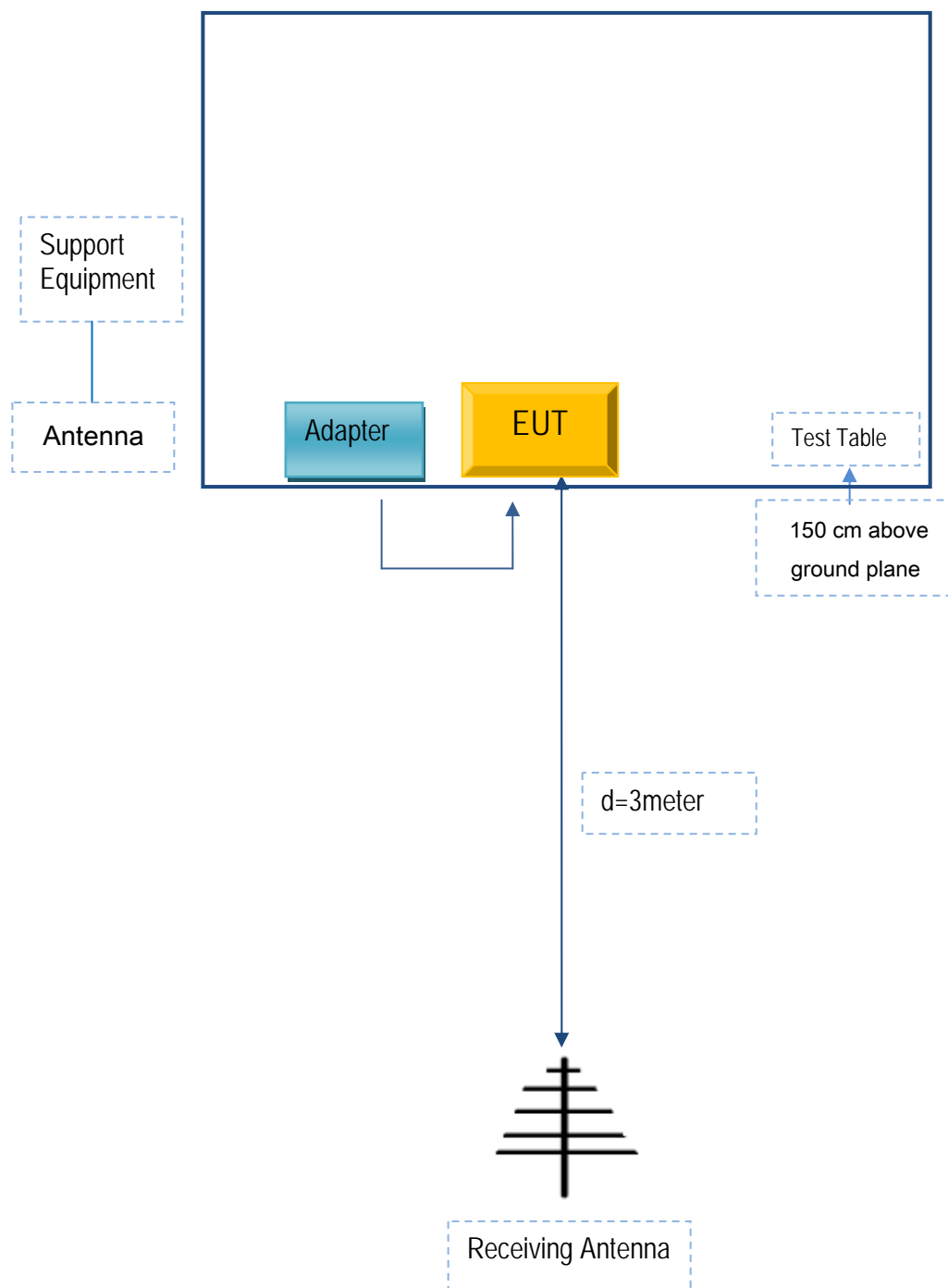


Radiated Spurious Emissions Test Setup Above  
1GHz

## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

#### Block Configuration Diagram for Radiated Emissions





## **Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION**

The following is a description of supporting equipment and details of cables used with the EUT.

| Manufacturer | Equipment Description | Model | Calibration Date | Calibration Due Date |
|--------------|-----------------------|-------|------------------|----------------------|
| N/A          | N/A                   | N/A   | N/A              | N/A                  |

|             |                 |
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## Annex C.ii. EUT OPERATING CONKITIONS

N/A

|             |                 |
|-------------|-----------------|
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## Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

|             |                 |
|-------------|-----------------|
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## Annex E. DECLARATION OF SIMILARITY

N/A