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Rev.:

**Innetech Standard Form**

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# **Electronic Performance Test Report**

## **(GSM850/GSM900/DCS/PCS/UMTS850/UMTS1900 /UMTS2100/GPS/BT)**

**C8093**

**Written by: HouTong**

**Date: 2011-3-15**

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## 1.0 Project Objective

To design, test, and measure a five-band internal antenna for cellular phone named C8093 handsets which is provided by the customer.

## 2.0 Test Method and Condition

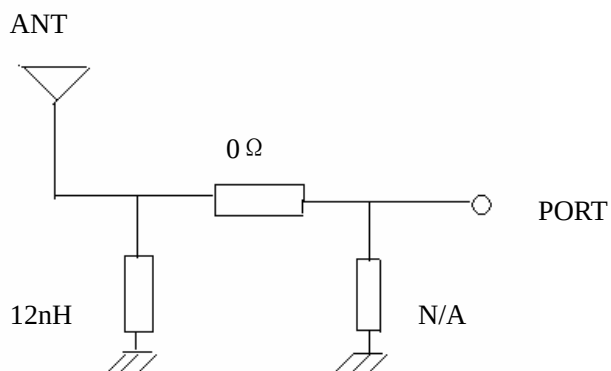
- In order to assure the best performance of the antenna, the antenna should be mounted on the customer supplied handset containing the PCB with the right matching circuit.
- The handset should be in the vertically direction on a nonconductive fixture center (The fixture should be at the center of the turn table).
- The test equipment should be calibrated before the measurement.
- The return loss results for the samples were measured using Agilent 8753ES.
- The efficiency and Gain results presented in this report were all measured in the measurement facility. A spherical near-field anechoic chamber and an Agilent 8753ES network analyzer were used to measure the antenna patterns. The accuracy of the chamber is +/- 0.5dB on antenna gain measurements as reported by the supplier of the chamber.
- The TRP and TIS results in this report were all measured in the measurement facility. A spherical near-field anechoic chamber and an MT8820 Radio Communication Analyzer were used to measure the antenna TRP&TIS. The accuracy of the chamber is +/- 0.5dB on antenna TRP&TIS measurements as reported by the supplier of the chamber.



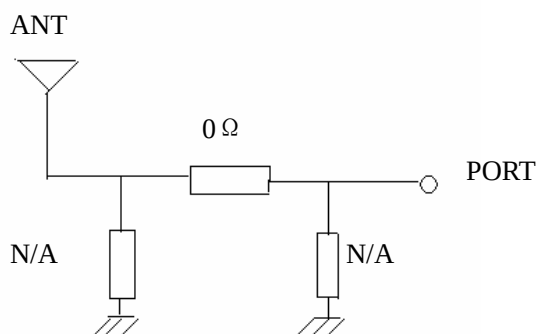
### 3.0 Test Result

#### 3.1 Matching Circuit

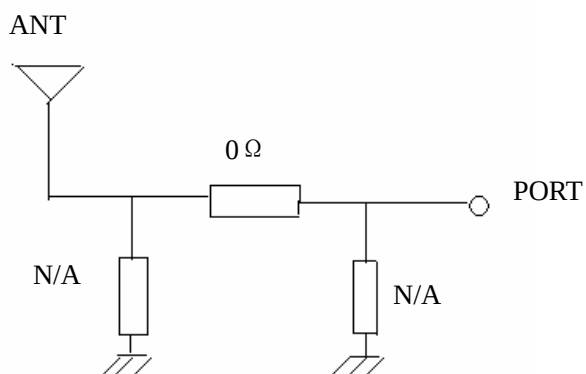
##### MAIN



##### BT



##### GPS





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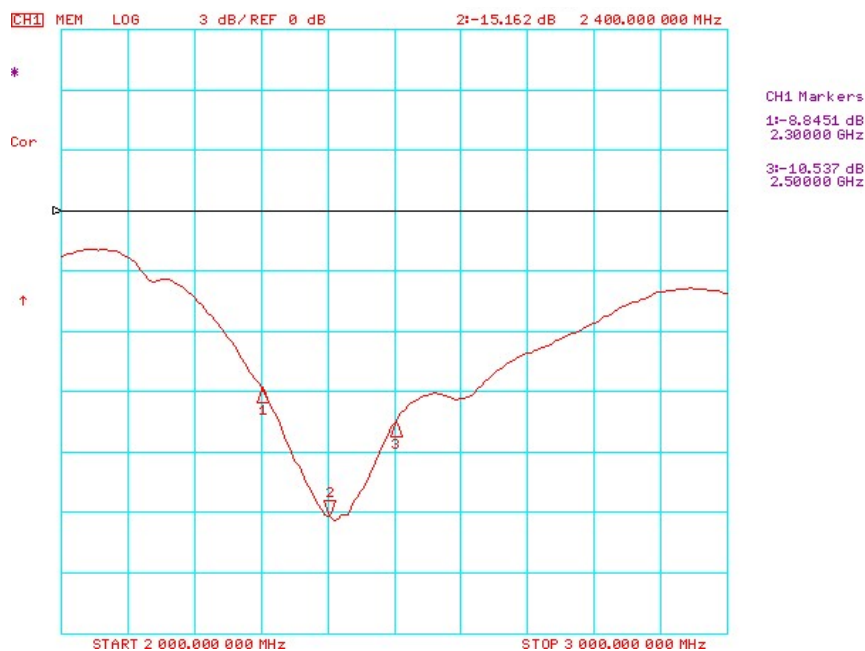
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### 3.2 Return Loss

#### MAIN



#### BT



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## GPS



## 3.3 Efficiency

|     | Freq. (MHz) | Efficiency (%) | Gain (dB) |
|-----|-------------|----------------|-----------|
| GPS | 1575        | 46.39          | -1.65     |
| BT  | 2400        | 45.29.         | -1.27     |



### 3.4 TRP/TIS

#### Main (Free Space)

| Test band | channel        | TRP   | TIS     |
|-----------|----------------|-------|---------|
| GSM850    | 128            | 26.23 | -104.34 |
|           | 190            | 27.53 | -103.56 |
|           | 251            | 28.25 | -103.66 |
| GSM900    | 975            | 27.76 | -103.32 |
|           | 37             | 27.35 | -102.36 |
|           | 124            | 27.27 | -102.77 |
| DCS1800   | 512            | 25.64 | -104.35 |
|           | 698            | 25.21 | -104.67 |
|           | 885            | 23.87 | -103.34 |
| PCS1900   | 512            | 24.36 | -104.25 |
|           | 660            | 24.53 | -103.75 |
|           | 810            | 25.19 | -102.35 |
| UMTS850   | UL4133 DL4358  | 16.32 | -106.66 |
|           | UL4175 DL4400  | 17.53 | -105.74 |
|           | UL4232 DL4457  | 17.86 | -105.43 |
| UMTS1900  | UL9262 DL9662  | 18.53 | -106.24 |
|           | UL9400 DL9800  | 18.57 | -106.43 |
|           | UL9538 DL9938  | 19.21 | -105.35 |
| UMTS2100  | UL9612 DL10562 | 18.67 | -107.67 |
|           | UL9750 DL10700 | 18.42 | -106.75 |
|           | UL9888 DL10838 | 19.79 | -107.53 |



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### Main (Hand R)

| Test band | channel        | TRP   | TIS     |
|-----------|----------------|-------|---------|
| GSM850    | 128            | 20.12 | -97.54  |
|           | 190            | 20.43 | -97.34  |
|           | 251            | 21.34 | -96.23  |
| GSM900    | 975            | 21.28 | -95.53  |
|           | 37             | 20.77 | -95.32  |
|           | 124            | 20.53 | -94.75  |
| DCS1800   | 512            | 19.23 | -99.32  |
|           | 698            | 19.34 | -98.45  |
|           | 885            | 18.53 | -97.67  |
| PCS1900   | 512            | 18.22 | -98.32  |
|           | 660            | 19.45 | -97.67  |
|           | 810            | 18.78 | -96.75  |
| UMTS850   | UL4133 DL4358  | 11.53 | -99.54  |
|           | UL4175 DL4400  | 12.34 | -99.34  |
|           | UL4232 DL4457  | 12.24 | -98.32  |
| UMTS1900  | UL9262 DL9662  | 13.43 | -99.39  |
|           | UL9400 DL9800  | 14.54 | -99.56  |
|           | UL9538 DL9938  | 14.29 | -99.76  |
| UMTS2100  | UL9612 DL10562 | 14.56 | -100.75 |
|           | UL9750 DL10700 | 14.64 | -100.64 |
|           | UL9888 DL10838 | 14.43 | -101.40 |

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### Main(Head R)

| Test band | channel        | TRP   | TIS     |
|-----------|----------------|-------|---------|
| GSM850    | 128            | 22.32 | -98.45  |
|           | 190            | 23.21 | -99.46  |
|           | 251            | 23.45 | -98.96  |
| GSM900    | 975            | 24.85 | -99.34  |
|           | 37             | 23.76 | -98.64  |
|           | 124            | 23.33 | -97.76  |
| DCS1800   | 512            | 21.53 | -99.90  |
|           | 698            | 21.64 | -99.93  |
|           | 885            | 21.00 | -99.83  |
| PCS1900   | 512            | 20.44 | -99.92  |
|           | 660            | 21.64 | -99.72  |
|           | 810            | 21.16 | -99.57  |
| UMTS850   | UL4133 DL4358  | 12.33 | -101.57 |
|           | UL4175 DL4400  | 13.56 | -101.32 |
|           | UL4232 DL4457  | 14.64 | -100.74 |
| UMTS1900  | UL9262 DL9662  | 15.32 | -101.80 |
|           | UL9400 DL9800  | 16.35 | -101.45 |
|           | UL9538 DL9938  | 16.15 | -101.23 |
| UMTS2100  | UL9612 DL10562 | 16.56 | -102.57 |
|           | UL9750 DL10700 | 16.62 | -102.53 |
|           | UL9888 DL10838 | 17.01 | -102.56 |

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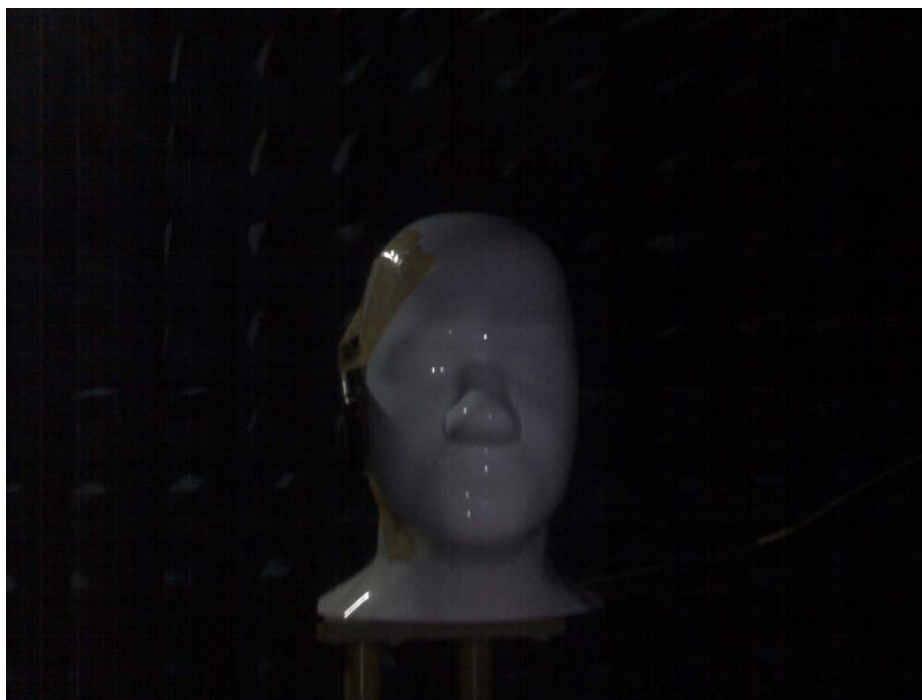
## 3.5 SAR

### Main

| 测试项目    | 10g 平均<br>(mW/g) | 1g 平均<br>(mW/g) |
|---------|------------------|-----------------|
| GSM 850 | 0.63             | 0.89            |
| GSM 900 | 0.53             | 1.02            |
| DCS1800 | 0.72             | 1.10            |
| PCS1900 | 0.68             | 0.97            |
| UMT850  | 0.66             | 1.08            |
| UMT1900 | 0.50             | 1.05            |
| UMT2100 | 0.63             | 0.91            |

## 3.6 Picture

### HEAD (R)



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