



## CALIBRATION CERTIFICATE

# 华东国家计量测试中心 上海市计量测试技术研究院

# 校准证书

委托者  
Customer

基础性能试验中心

委托者地址  
Address of customer

宜山路 716 号

器具名称  
Name of instrument

Dipole

制造厂  
Manufacturer

ANTENNESSA 公司

型号/规格  
Model/Specification

/

器具编号  
No. of instrument

36/05 DIP C20 (850MHz dipole), 36/05 DIP D21 (900MHz dipole),  
36/05 DIP F22 (1800MHz dipole), SN 36/05 DIP G23 (1900MHz  
dipole), 36/05 DIP I24 (2000MHz dipole), SN 36/05 DIP  
J25(2450MHz dipole)

器具准确度  
Instrument accuracy

/

证书批准人  
Approved by

陆福政

(机构校准专用章)

核 验 员  
Checked by

廖 轶

校 准 员  
Calibrated by

朱建刚

校准日期 2007 年 10 月 23 日  
Date for calibrated Year Month Day

投诉电话: 021-50798262  
Tel. for complaint

地址: 上海市张衡路 1500 号(总部) 电话: 021-38839800 传真: 021-50798390 邮编: 201203  
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上海市宜山路 716 号(分部) 电话: 021-64701390 传真: 021-64701810 邮编: 200233  
No. 716 Yishan Road, Shanghai(branch) Tel. Fax. Post Code

未经本院批准, 部分采用本证书内容无效。  
Partly using this certificate will not be admitted unless allowed by SIMT.



国家法定计量检定机构计量授权证书号(中心/院): (国)法计(2002)01039号/(2002)01019号  
The number of the Certificate of Metrological Authorization to The Legal Metrological Verification Institution is No. (2002) 01039 / No. (2002) 01019

中国实验室国家认可委员会(CNAL)实验室认可证书号: No.L0134  
The number of the certificate accredited by CNAL is No.L0134

本次校准所依据的技术规范(代号、名称):  
Reference documents for the calibration (code, name)

IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head form Wireless Communications Devices: Measure Techniques", December 2003

CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields form mobile phones (300 MHz – 3 GHz)", July 2001

Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

本次校准所使用的主要计量标准器具:  
Main measurement standards used in this calibration

| 名称/型号<br>Name/Model | 编号<br>Number | 证书编号/有效期限<br>Certificate No./Due date | 测量范围/准确度<br>Measuring range/accuracy                                     |
|---------------------|--------------|---------------------------------------|--------------------------------------------------------------------------|
| 矢量网络分析仪<br>ZVB 8    | 容-027-27     | 2007F31-10-001767<br>2008.06.27       | 300 kHz to 8 GHz, 频率分辨率: 100 μHz,<br>测量时间: < 8 ms, 测量带宽: 1 Hz to 500 kHz |

以上计量标准器具的量值溯源至国家基准。  
Quantity values of above measurement standards used in this calibration are traced to those of the national primary standards in the P.R. China.

校准地点及环境条件:  
Location and environmental condition for the calibration

地点: 上海市计量测试技术研究院  
Location

温度: 21.8-22.2 °C; 湿度: 43 %RH; 其它: /  
Ambient temperature Relative humidity Others

本次校准结果的扩展不确定度:  
Expanded uncertainty

/

校准结果/说明:  
Results of calibration and additional explanation

参见校准结果/说明

校准规范要求:  
Return Loss must be less than -20dB

符合校准规范要求

本证书提供的结果仅对本次被校的器具有效。  
The data are valid only for the instrument(s).

**校准结果/说明 (续页):**

Results of calibration and additional explanation (continued page)

**1. Calibration procedure:**

Return Loss is measured with the dipole mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis. During calibration, The flat phantom is filled with the liquid whose parameters are calibrated relative to different frequency.

**2. Calibration Conditions:****A. The spacer from Dipole center to TSL:**

| Distance Dipole Center - TSL | Frequency                            |
|------------------------------|--------------------------------------|
| 15mm±0.2mm with spacer       | 900MHz, 850MHz                       |
| 10mm±0.2mm with spacer       | 1800MHz, 1900 MHz, 2000MHz, 2450 MHz |

**B. Head TSL parameters:**

The following parameters and calculation were applied.

Head TSL temperature change is well controlled to be within 22±0.2°C during test.

| Frequency | Nominal Head TSL Parameters<br>(Permittivity/ Conductivity) | Measurement Head TSL parameters<br>(Permittivity/ Conductivity) |
|-----------|-------------------------------------------------------------|-----------------------------------------------------------------|
| 850 MHz   | 42.53/0.94                                                  | 41.97/0.96                                                      |
| 900 MHz   | 42.00/0.99                                                  | 41.20/0.97                                                      |
| 1800 MHz  | 40.00/1.38                                                  | 39.71/1.36                                                      |
| 1900 MHz  | 40.00/1.40                                                  | 39.65/1.37                                                      |
| 2000 MHz  | 40.00/1.40                                                  | 39.15/1.39                                                      |
| 2450 MHz  | 39.00/1.84                                                  | 38.56/1.82                                                      |

**C. Body TSL parameters:**

The following parameters and calculation were applied.

Body TSL temperature change is well controlled to be within 22±0.2°C during test.

| Frequency | Nominal Body TSL Parameters<br>(Permittivity/ Conductivity) | Measurement Body TSL parameters<br>(Permittivity/ Conductivity) |
|-----------|-------------------------------------------------------------|-----------------------------------------------------------------|
| 850 MHz   | 55.20/0.97                                                  | 50.91/0.93                                                      |
| 900 MHz   | 55.00/1.05                                                  | 54.63/1.04                                                      |
| 1800 MHz  | 53.30/1.52                                                  | 51.39/1.53                                                      |
| 1900 MHz  | 53.30/1.52                                                  | 51.98/1.52                                                      |
| 2000 MHz  | 53.30/1.52                                                  | 51.58/1.51                                                      |
| 2450 MHz  | 52.70/1.95                                                  | /                                                               |



校准结果/说明 (续页):

Results of calibration and additional explanation (continued page)

### 3. Measurement Results:

| Frequency       | Return Loss with Head TSL | Return Loss with Body TSL |
|-----------------|---------------------------|---------------------------|
| 850 MHz Dipole  | -28.06 dB                 | -27.15 dB                 |
| 900 MHz Dipole  | -23.17 dB                 | -22.19 dB                 |
| 1800 MHz Dipole | -21.14 dB                 | -21.08 dB                 |
| 1900 MHz Dipole | -22.43 dB                 | -21.56 dB                 |
| 2000 MHz Dipole | -22.71 dB                 | -21.25 dB                 |
| 2450 MHz Dipole | -37.56 dB                 | /                         |

备注: /

校准结果内容结束