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SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA

校准证书编号: 2008J10-10-812006
Calibrated certificate series No.

CALIBRATION CERTIFICATE

上海市计量测试技术研究院 华东国家计量测试中心

校准证书

委托者
Customer

程智科技股份(昆山)有限公司
Compliance Certification Services Inc.

委托者地址
Address of customer

江苏省昆山市(留学创业园)伟业路10号
No. 10, Wei-Ye Rd., Innovation park, Eco & Tec, Development Zone, Kun Shan City, Jiang Su, P. R. O. C.

器具名称
Name of instrument

偶极子天线
DIPOLE ANTENNA

制造厂
Manufacturer

ANTENNESSA 公司

型号/规格
Model/Specification

DIPOLE 2450MHz

器具编号
No. of instrument

SN 48/05 DIPJ37

器具准确度
Instrument accuracy

/

证书批准人
Approved by

(机构校准专用章)

核 验 员
Checked by

校 准 员
Calibrated by

校准日期 2008 年 12 月 10 日
Date for calibrated Year Month Day

投诉电话: 021-50798262

地址: 上海市张衡路 1500 号(总部)
Address No. 1500 Zhangheng Road, Shanghai(headquarters)

电话: 021-38839800
Tel.

传真: 021-50798390
Fax.

邮编: 201203
Post Code Tel. for complaint

上海市宜山路 716 号(分部)
No. 716 Yishan Road, Shanghai(branch)

电话: 021-64701390
Tel.

传真: 021-64701810
Fax.

邮编: 200233
Post Code

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

 中国合格评定国家认可委员会实验室认可证书号: No. CNAS L0134
 The number of the certificate accredited by CNAS 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)

JCJ/J101002.1/0-2007 SAR偶极子天线校准规范

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"

IEC 62209-1: 2005 Procedure to measure the Specific Absorption Rate (SAR) in the frequency range of 300 MHz to 3 GHz Part 1: hand-held mobile wireless communication devices

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 Name/Model	编号 Number	证书编号/有效期限 Certificate No./Due date	测量范围/准确度 Measuring range/accuracy
VECTOR NETWORK ANALYZER ZVB 8	容-027-27	2008F31-10-001907 2009.06.26	300 kHz~8 GHz, Frequency resolution: 100 μ Hz, Measurement time: < 8 ms, Measurement bandwidths: 1 Hz~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: 宜山路 716 号 (No. 716 Yishan Road)

Location

 温度: 23 $^{\circ}$ C; 湿度: 49 %RH; 其它: /

Ambient temperature

Relative humidity

Others

本次校准结果的扩展不确定度:

Expanded uncertainty

 +3dB 至 -15dB: $U=0.8$ dB ($k=2$)

 -15dB 至 -25dB: $U=1.2$ dB ($k=2$)

 -25dB 至 -35dB: $U=3.1$ dB ($k=2$)

校准结果/说明:

Results of calibration and additional explanation

Pass

The requirements of the calibration criterion: return Loss must be less than -20dB

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).

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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
10mm±0.2mm with spacer	2450MHz

B. Head TSL parameters

The following parameters and calculation were applied.

Head TSL temperature change is well controlled to be within $22\pm0.2^{\circ}\text{C}$ during test.

Frequency	Nominal Head TSL Parameters (Permittivity/ Conductivity)	Measurement Head TSL parameters (Permittivity/ Conductivity)
2450 MHz	39.20/1.80	40.20/1.83

C. Body TSL parameters

The following parameters and calculation were applied.

Body TSL temperature change is well controlled to be within $22\pm0.2^{\circ}\text{C}$ during test.

Frequency	Nominal Body TSL Parameters (Permittivity/ Conductivity)	Measurement Body TSL parameters (Permittivity/ Conductivity)
2450 MHz	52.70/1.95	53.12/1.95

3. Measurement Results

Frequency	Return Loss with Head TSL	Return Loss with Body TSL
2450 MHz	-24.43 dB	-21.80



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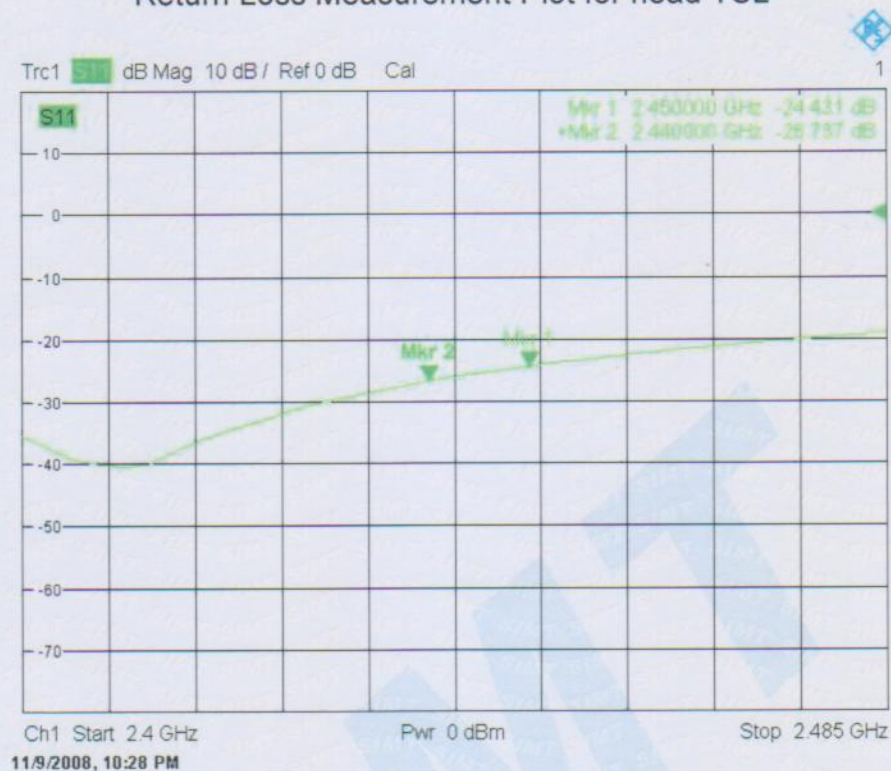
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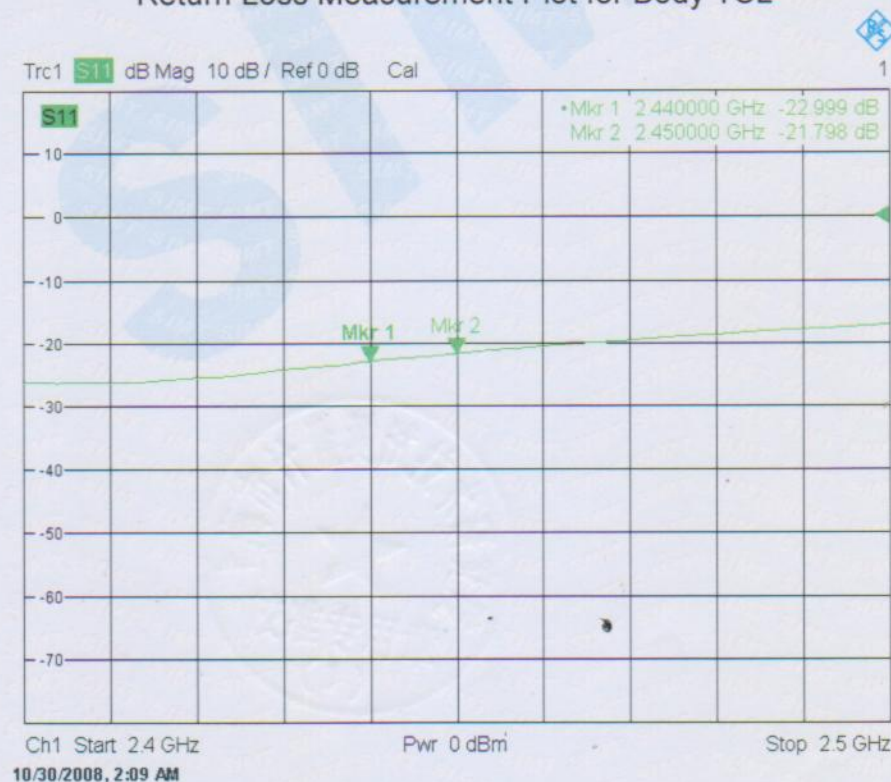
校准结果/说明 (续页):

Results of calibration and additional explanation (continued page)

Return Loss Measurement Plot for head TSL



Return Loss Measurement Plot for Body TSL



Remark: Attachment 1:SAR validation & Test equipment

End

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Attachment 1: SAR validation & Test equipment

Validation	Condition	SAR Value (W/kg)	
		1g	10g
SAR measured with Head TSL	1W (input power)	53.49	24.46
SAR measured with Body TSL	1W (input power)	50.22	23.04

名称/型号 Name/Model	编号 Number	证书编号/有效期限 Certificate No./Due date	测量范围/准确度 Measuring range/accuracy
6 axis Robot KR3	容-027-01	/	6 axes, Repeatability: ± 0.05 mm, Nominal payload: 3 kg
Vector Network Analyzer ZVB 8	容-027-27	2008F31-10-001907 2009.06.26	300 kHz to 8 GHz, Frequency resolution: 100 μ Hz, Measurement time: < 8 ms, Measurement bandwidths: 1 Hz to 500 kHz
Signal Generator SMT 06	容-027-15	2008F33-10-001469 2009.06.26	5 kHz - 6 GHz, Resolution: 0.1Hz, -144 to + 13 dBm, Max. RF power: 1W, Max. DC voltage: 0V / Level > -127 dBm: f<1.5 GHz: < 1dB; f>1.5 GHz: < 1.5dB; f> 3GHz: < 2dB
Power Meter NRVD	容-027-16	2008F31-10-001906 2009.06.24	100 kHz to 6 GHz, 10nW to 500mW
Millivoltmeter 2000	容-027-26	2008F11-10-001004 2009.06.19	Measurement range: 100.0000mV ~ 1000.000V Sensibility: 0.1 μ V ~ 1m V.
Power Amplifier BLMA 2060-2	容-027-19	2008F33-10-001468 2009.06.26	2 - 6 GHz; Output: 2W; Gain: min 33 / typ 35, ± 2 dB; Harmonics: 2nd: 20 dBc, 3rd: 20 dBc; Line power: 75 W.
Isotropic E-Field Probe E-FIELD PROBE	容-027-54	2008J10-10-801001 2008.12.25	Dipole resistance (in the connector plane): 1M Ω to 2M Ω Axial isotropy in human-equivalent liquids: <0.25dB Hemispherical Isotropy in human equivalent liquids <0.5dB, Linearity <0.5dB, Lower SAR detection threshold: 0.0015 Watts/kg
SAM Phantom	容-027-22	/	/