

# 中国计量科学研究院

National Institute of Metrology, China



中国认可  
国际互认  
校准  
CALIBRATION  
CNAS L0502

## 校准证书

Calibration Certificate

证书编号  
Certificate No.

客户名称  
Client

器具名称  
Instrument

双脊喇叭天线

型号/规格  
Type/Model

OBH08180

出厂编号  
Serial No.

32849001

生产厂商  
Manufacturer

OCEAN MICROWAVE

联络信息  
Contact Information

校准日期  
Date of Calibration

2024-07-02

接收日期  
Date of Receiving

2024-07-02

批准人:

刘汉

Approved by

发布日期: 2025 年 06 月 27 日  
Date of Issue

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# 中国计量科学研究院

National Institute of Metrology, China



证书编号  
Certificate No.

中国计量科学研究院（NIM）是国家最高的计量科学研究中心和国家级法定计量技术机构。1999 年授权签署了国际计量委员会（CIPM）《国家计量基(标)准和国家计量院签发的校准与测量证书互认协议》（CIPM MRA）。The National Institute of Metrology (NIM) is China's national metrology institute (NMI) and a state-level legal metrology institute. NIM is China's signatory to the Mutual Recognition of National Measurement Standards and of Calibration and Measurement Certificates Issued by National Metrology Institutes (CIPM MRA) which is arranged by the International Committee of Weights and Measures (CIPM).

质量管理体系符合 ISO/IEC17025 标准，通过中国合格评定国家认可委员会（CNAS）和亚太计量规划组织（APMP）联合评审的校准和测量能力（CMCs）在国际计量局（BIPM）关键比对数据库中公布。NIM's quality management system meets requirements of the ISO/IEC 17025. Its Calibration and Measurement Capabilities (CMCs) that are peer reviewed both by China National Accreditation Service for Conformity Assessment (CNAS) and the Asia Pacific Metrology Programme (APMP) are published in the International Bureau of Weights and Measures (BIPM) Key Comparison Database (KCDB).

2020 年，NIM 和 CNAS 就认可领域的技术评价活动签署了谅解备忘录，承认 NIM 的计量支撑作用和出具的校准/检测结果的溯源效力。NIM and CNAS signed a Memorandum of Understanding (MOU) for Recognition of Technical Assessment in Laboratory Accreditation Field in 2020, in which CNAS recognizing the technical supporting role of NIM in laboratory accreditation and the traceability of NIM's calibration / test results.

校准结果不确定度的评估和表述均符合 JJF1059 系列标准的要求。The evaluation and expression of uncertainty of the calibration results are in line with the requirements of JJF1059 series standards.

| 校准所依据/参照的技术文件（代号、名称）Reference documents (Code,Name)                                                               |                                                             |                                            |                         |                                    |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------|-------------------------|------------------------------------|
| 参照 JJF 1893-2021, NIM-ZY-XD-TX-003, CISPR16-1-6-2022,ANSI C63.5-2017<br>See page 3 for details of standard names. |                                                             |                                            |                         |                                    |
| 校准环境条件及地点 Calibration place and environment                                                                       |                                                             |                                            |                         |                                    |
| 温度 Temperature:                                                                                                   |                                                             | 23℃                                        | 地点 Location:            | 昌-18-1005                          |
| 湿度 Humidity:                                                                                                      |                                                             | 35% RH                                     | 其它 Others:              | /                                  |
| 校准使用的计量基（标）准装置(含标准物质)/主要仪器<br>Reference Standards (Including the Reference Material) / Instruments used           |                                                             |                                            |                         |                                    |
| 名称<br>Name                                                                                                        | 测量范围<br>Measurement Range                                   | 不确定度/<br>准确度等级<br>Uncertainty/<br>Accuracy | 证书编号<br>Certificate No. | 证书有效期至<br>Due Date<br>(YYYY-MM-DD) |
| 矢量网络分析仪<br>Vector Network Analyzer                                                                                | Frequency:<br>10MHz ~ 50GHz;<br>S21 dynamic range:<br>124dB | S21:<br>0.07 dB~0.20 dB<br>(k=2)           | XDgp2025-01724          | 2026-06-05                         |



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# 校准结果

Calibration Results

校准参考文件

Calibration Reference Standard Documents

JJF 1893-2021

(0.2~40)GHz 电磁兼容喇叭天线校准规范

NIM-ZY-XD-TX-003

鞭状、双锥、对数周期、复合及微波喇叭天线自编校准规范

CISPR16-1-6-2022

Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-6: Radio disturbance and immunity measuring apparatus - EMC antenna calibration (6、7、8、9)

ANSI C63.5-2017

American National Standard for Electromagnetic Compatibility-Radiated Emission Measurements in Electromagnetic Interference (EMI) Control-Calibration and Qualification of Antennas (9 kHz to 40 GHz) (5、6、7)

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## 校准结果

Calibration Results

表 1. 校准数据

Table 1 Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 0.8                      | 22.7                  | 5.6                 | 1.85               |
| 0.805                    | 22.7                  | 5.6                 | 1.70               |
| 0.81                     | 22.5                  | 5.9                 | 1.58               |
| 0.815                    | 22.6                  | 5.9                 | 1.49               |
| 0.82                     | 22.6                  | 5.8                 | 1.41               |
| 0.825                    | 22.6                  | 6.0                 | 1.35               |
| 0.83                     | 22.5                  | 6.1                 | 1.31               |
| 0.835                    | 22.4                  | 6.2                 | 1.29               |
| 0.84                     | 22.6                  | 6.1                 | 1.30               |
| 0.845                    | 22.8                  | 5.9                 | 1.31               |
| 0.85                     | 22.8                  | 6.0                 | 1.34               |
| 0.855                    | 22.9                  | 6.0                 | 1.38               |
| 0.86                     | 23.0                  | 5.9                 | 1.42               |
| 0.865                    | 23.2                  | 5.8                 | 1.48               |
| 0.87                     | 23.1                  | 5.9                 | 1.52               |
| 0.875                    | 23.2                  | 5.9                 | 1.58               |
| 0.88                     | 23.3                  | 5.8                 | 1.64               |
| 0.885                    | 23.3                  | 5.8                 | 1.69               |
| 0.89                     | 23.4                  | 5.8                 | 1.74               |
| 0.895                    | 23.6                  | 5.7                 | 1.78               |
| 0.9                      | 23.7                  | 5.6                 | 1.83               |
| 0.905                    | 23.9                  | 5.4                 | 1.88               |
| 0.91                     | 23.8                  | 5.6                 | 1.94               |
| 0.915                    | 23.9                  | 5.5                 | 2.00               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 0.92                     | 24.2                  | 5.3                 | 2.04               |
| 0.925                    | 24.2                  | 5.4                 | 2.08               |
| 0.93                     | 24.5                  | 5.1                 | 2.12               |
| 0.935                    | 24.4                  | 5.2                 | 2.17               |
| 0.94                     | 24.5                  | 5.2                 | 2.20               |
| 0.945                    | 24.7                  | 5.0                 | 2.24               |
| 0.95                     | 24.3                  | 5.5                 | 2.27               |
| 0.955                    | 24.6                  | 5.2                 | 2.30               |
| 0.96                     | 24.6                  | 5.3                 | 2.33               |
| 0.965                    | 24.5                  | 5.4                 | 2.36               |
| 0.97                     | 24.9                  | 5.1                 | 2.38               |
| 0.975                    | 24.6                  | 5.4                 | 2.39               |
| 0.98                     | 24.9                  | 5.2                 | 2.40               |
| 0.985                    | 25.1                  | 5.0                 | 2.41               |
| 0.99                     | 24.8                  | 5.3                 | 2.41               |
| 0.995                    | 25.0                  | 5.2                 | 2.41               |
| 1                        | 24.8                  | 5.4                 | 2.41               |
| 1.05                     | 24.9                  | 5.8                 | 2.26               |
| 1.1                      | 25.0                  | 6.1                 | 2.00               |
| 1.15                     | 24.7                  | 6.7                 | 1.74               |
| 1.2                      | 24.4                  | 7.4                 | 1.50               |
| 1.25                     | 25.0                  | 7.1                 | 1.29               |
| 1.3                      | 25.1                  | 7.3                 | 1.12               |
| 1.35                     | 25.2                  | 7.6                 | 1.10               |
| 1.4                      | 25.8                  | 7.3                 | 1.23               |
| 1.45                     | 26.5                  | 7.0                 | 1.35               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 1.5                      | 26.7                  | 7.1                 | 1.43               |
| 1.55                     | 26.9                  | 7.2                 | 1.46               |
| 1.6                      | 26.9                  | 7.4                 | 1.46               |
| 1.65                     | 27.2                  | 7.4                 | 1.43               |
| 1.7                      | 27.1                  | 7.7                 | 1.36               |
| 1.75                     | 27.2                  | 7.9                 | 1.24               |
| 1.8                      | 27.0                  | 8.4                 | 1.10               |
| 1.85                     | 26.7                  | 8.8                 | 1.04               |
| 1.9                      | 27.4                  | 8.4                 | 1.16               |
| 1.95                     | 27.8                  | 8.3                 | 1.25               |
| 2                        | 28.1                  | 8.1                 | 1.30               |
| 2.05                     | 28.6                  | 7.9                 | 1.31               |
| 2.1                      | 28.6                  | 8.0                 | 1.30               |
| 2.15                     | 28.5                  | 8.4                 | 1.30               |
| 2.2                      | 28.4                  | 8.6                 | 1.27               |
| 2.25                     | 28.4                  | 8.9                 | 1.24               |
| 2.3                      | 28.4                  | 9.1                 | 1.18               |
| 2.35                     | 28.5                  | 9.1                 | 1.11               |
| 2.4                      | 28.9                  | 9.0                 | 1.06               |
| 2.45                     | 29.1                  | 8.9                 | 1.10               |
| 2.5                      | 29.3                  | 8.9                 | 1.18               |
| 2.55                     | 29.5                  | 8.8                 | 1.25               |
| 2.6                      | 29.7                  | 8.8                 | 1.29               |
| 2.65                     | 29.8                  | 8.9                 | 1.31               |
| 2.7                      | 30.1                  | 8.7                 | 1.29               |
| 2.75                     | 30.1                  | 8.9                 | 1.24               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 2.8                      | 29.9                  | 9.3                 | 1.19               |
| 2.85                     | 30.2                  | 9.1                 | 1.15               |
| 2.9                      | 30.1                  | 9.3                 | 1.12               |
| 2.95                     | 30.5                  | 9.1                 | 1.15               |
| 3                        | 31.2                  | 8.6                 | 1.21               |
| 3.05                     | 31.2                  | 8.7                 | 1.27               |
| 3.1                      | 31.7                  | 8.4                 | 1.32               |
| 3.15                     | 32.3                  | 7.9                 | 1.34               |
| 3.2                      | 32.3                  | 8.0                 | 1.33               |
| 3.25                     | 32.5                  | 7.9                 | 1.30               |
| 3.3                      | 32.2                  | 8.3                 | 1.26               |
| 3.35                     | 32.2                  | 8.5                 | 1.22               |
| 3.4                      | 32.3                  | 8.6                 | 1.21               |
| 3.45                     | 32.1                  | 8.9                 | 1.22               |
| 3.5                      | 32.1                  | 9.0                 | 1.24               |
| 3.55                     | 32.2                  | 9.1                 | 1.27               |
| 3.6                      | 32.2                  | 9.1                 | 1.31               |
| 3.65                     | 32.6                  | 8.8                 | 1.34               |
| 3.7                      | 33.0                  | 8.6                 | 1.35               |
| 3.75                     | 33.1                  | 8.6                 | 1.34               |
| 3.8                      | 33.2                  | 8.7                 | 1.30               |
| 3.85                     | 33.2                  | 8.8                 | 1.26               |
| 3.9                      | 33.1                  | 8.9                 | 1.22               |
| 3.95                     | 33.1                  | 9.0                 | 1.20               |
| 4                        | 33.1                  | 9.1                 | 1.20               |
| 4.05                     | 33.3                  | 9.1                 | 1.22               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 4.1                      | 33.4                  | 9.0                 | 1.23               |
| 4.15                     | 33.4                  | 9.2                 | 1.23               |
| 4.2                      | 33.6                  | 9.1                 | 1.23               |
| 4.25                     | 33.8                  | 9.0                 | 1.22               |
| 4.3                      | 34.1                  | 8.8                 | 1.21               |
| 4.35                     | 34.5                  | 8.4                 | 1.22               |
| 4.4                      | 34.4                  | 8.7                 | 1.28               |
| 4.45                     | 34.5                  | 8.7                 | 1.35               |
| 4.5                      | 34.3                  | 9.0                 | 1.38               |
| 4.55                     | 34.0                  | 9.3                 | 1.36               |
| 4.6                      | 34.1                  | 9.4                 | 1.33               |
| 4.65                     | 34.0                  | 9.6                 | 1.31               |
| 4.7                      | 34.0                  | 9.7                 | 1.31               |
| 4.75                     | 34.4                  | 9.4                 | 1.31               |
| 4.8                      | 34.3                  | 9.6                 | 1.30               |
| 4.85                     | 34.6                  | 9.3                 | 1.29               |
| 4.9                      | 34.7                  | 9.3                 | 1.27               |
| 4.95                     | 34.6                  | 9.5                 | 1.26               |
| 5                        | 34.6                  | 9.6                 | 1.23               |
| 5.05                     | 34.4                  | 9.8                 | 1.22               |
| 5.1                      | 34.2                  | 10.1                | 1.21               |
| 5.15                     | 34.1                  | 10.3                | 1.22               |
| 5.2                      | 34.2                  | 10.3                | 1.23               |
| 5.25                     | 34.1                  | 10.5                | 1.24               |
| 5.3                      | 34.3                  | 10.4                | 1.26               |
| 5.35                     | 34.5                  | 10.3                | 1.28               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 5.4                      | 34.5                  | 10.3                | 1.30               |
| 5.45                     | 34.7                  | 10.2                | 1.32               |
| 5.5                      | 34.8                  | 10.2                | 1.33               |
| 5.55                     | 34.8                  | 10.3                | 1.33               |
| 5.6                      | 34.7                  | 10.5                | 1.33               |
| 5.65                     | 34.6                  | 10.6                | 1.33               |
| 5.7                      | 34.6                  | 10.7                | 1.33               |
| 5.75                     | 34.6                  | 10.8                | 1.35               |
| 5.8                      | 34.5                  | 11.0                | 1.38               |
| 5.85                     | 34.7                  | 10.9                | 1.40               |
| 5.9                      | 34.8                  | 10.8                | 1.43               |
| 5.95                     | 34.9                  | 10.8                | 1.45               |
| 6                        | 35.0                  | 10.8                | 1.46               |
| 6.05                     | 35.3                  | 10.6                | 1.46               |
| 6.1                      | 35.2                  | 10.7                | 1.46               |
| 6.15                     | 35.1                  | 10.8                | 1.47               |
| 6.2                      | 35.1                  | 10.9                | 1.47               |
| 6.25                     | 35.0                  | 11.2                | 1.47               |
| 6.3                      | 35.1                  | 11.1                | 1.48               |
| 6.35                     | 35.0                  | 11.3                | 1.50               |
| 6.4                      | 35.1                  | 11.2                | 1.51               |
| 6.45                     | 35.2                  | 11.2                | 1.53               |
| 6.5                      | 35.4                  | 11.1                | 1.53               |
| 6.55                     | 35.5                  | 11.1                | 1.54               |
| 6.6                      | 35.5                  | 11.1                | 1.54               |
| 6.65                     | 35.5                  | 11.1                | 1.53               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 6.7                      | 35.5                  | 11.3                | 1.49               |
| 6.75                     | 35.5                  | 11.3                | 1.50               |
| 6.8                      | 35.5                  | 11.4                | 1.51               |
| 6.85                     | 35.4                  | 11.5                | 1.51               |
| 6.9                      | 35.6                  | 11.4                | 1.51               |
| 6.95                     | 35.6                  | 11.5                | 1.52               |
| 7                        | 35.8                  | 11.3                | 1.52               |
| 7.05                     | 35.9                  | 11.3                | 1.51               |
| 7.1                      | 36.0                  | 11.2                | 1.49               |
| 7.15                     | 36.0                  | 11.3                | 1.48               |
| 7.2                      | 36.1                  | 11.3                | 1.46               |
| 7.25                     | 35.9                  | 11.5                | 1.43               |
| 7.3                      | 36.0                  | 11.5                | 1.41               |
| 7.35                     | 36.0                  | 11.6                | 1.39               |
| 7.4                      | 36.0                  | 11.6                | 1.37               |
| 7.45                     | 36.1                  | 11.5                | 1.37               |
| 7.5                      | 36.0                  | 11.8                | 1.34               |
| 7.55                     | 36.4                  | 11.4                | 1.33               |
| 7.6                      | 36.4                  | 11.5                | 1.31               |
| 7.65                     | 36.5                  | 11.4                | 1.30               |
| 7.7                      | 36.4                  | 11.5                | 1.27               |
| 7.75                     | 36.6                  | 11.4                | 1.24               |
| 7.8                      | 36.4                  | 11.6                | 1.23               |
| 7.85                     | 36.5                  | 11.7                | 1.21               |
| 7.9                      | 36.3                  | 11.8                | 1.20               |
| 7.95                     | 36.4                  | 11.9                | 1.19               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 8                        | 36.5                  | 11.8                | 1.19               |
| 8.05                     | 36.5                  | 11.8                | 1.19               |
| 8.1                      | 36.7                  | 11.7                | 1.18               |
| 8.15                     | 36.8                  | 11.6                | 1.19               |
| 8.2                      | 36.8                  | 11.7                | 1.19               |
| 8.25                     | 36.9                  | 11.7                | 1.19               |
| 8.3                      | 36.8                  | 11.8                | 1.21               |
| 8.35                     | 36.8                  | 11.8                | 1.21               |
| 8.4                      | 36.8                  | 11.9                | 1.21               |
| 8.45                     | 36.8                  | 12.0                | 1.22               |
| 8.5                      | 36.7                  | 12.1                | 1.23               |
| 8.55                     | 36.8                  | 12.0                | 1.25               |
| 8.6                      | 36.9                  | 12.1                | 1.28               |
| 8.65                     | 36.8                  | 12.1                | 1.30               |
| 8.7                      | 37.0                  | 12.0                | 1.32               |
| 8.75                     | 37.1                  | 12.0                | 1.33               |
| 8.8                      | 37.2                  | 11.9                | 1.35               |
| 8.85                     | 37.2                  | 11.9                | 1.37               |
| 8.9                      | 37.2                  | 12.1                | 1.38               |
| 8.95                     | 37.2                  | 12.1                | 1.40               |
| 9                        | 37.1                  | 12.2                | 1.41               |
| 9.05                     | 37.1                  | 12.3                | 1.43               |
| 9.1                      | 37.2                  | 12.2                | 1.43               |
| 9.15                     | 37.1                  | 12.3                | 1.46               |
| 9.2                      | 37.2                  | 12.3                | 1.48               |
| 9.25                     | 37.3                  | 12.2                | 1.49               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 9.3                      | 37.4                  | 12.2                | 1.51               |
| 9.35                     | 37.4                  | 12.3                | 1.52               |
| 9.4                      | 37.5                  | 12.2                | 1.53               |
| 9.45                     | 37.5                  | 12.3                | 1.54               |
| 9.5                      | 37.5                  | 12.3                | 1.53               |
| 9.55                     | 37.5                  | 12.3                | 1.55               |
| 9.6                      | 37.3                  | 12.6                | 1.55               |
| 9.65                     | 37.5                  | 12.4                | 1.56               |
| 9.7                      | 37.4                  | 12.6                | 1.57               |
| 9.75                     | 37.5                  | 12.5                | 1.57               |
| 9.8                      | 37.5                  | 12.5                | 1.58               |
| 9.85                     | 37.6                  | 12.5                | 1.57               |
| 9.9                      | 37.6                  | 12.5                | 1.59               |
| 9.95                     | 37.6                  | 12.5                | 1.59               |
| 10                       | 37.6                  | 12.6                | 1.59               |
| 10.1                     | 37.6                  | 12.8                | 1.58               |
| 10.2                     | 37.5                  | 12.8                | 1.57               |
| 10.3                     | 37.5                  | 13.0                | 1.58               |
| 10.4                     | 37.6                  | 13.0                | 1.58               |
| 10.5                     | 37.7                  | 13.0                | 1.57               |
| 10.6                     | 37.6                  | 13.1                | 1.55               |
| 10.7                     | 37.6                  | 13.2                | 1.55               |
| 10.8                     | 37.7                  | 13.2                | 1.54               |
| 10.9                     | 37.7                  | 13.2                | 1.53               |
| 11                       | 37.8                  | 13.2                | 1.52               |
| 11.1                     | 37.9                  | 13.2                | 1.54               |



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### 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 11.2                     | 38.0                  | 13.2                | 1.55               |
| 11.3                     | 37.9                  | 13.3                | 1.58               |
| 11.4                     | 38.0                  | 13.4                | 1.58               |
| 11.5                     | 38.0                  | 13.4                | 1.58               |
| 11.6                     | 38.0                  | 13.5                | 1.55               |
| 11.7                     | 38.1                  | 13.5                | 1.54               |
| 11.8                     | 38.0                  | 13.6                | 1.52               |
| 11.9                     | 38.1                  | 13.7                | 1.50               |
| 12                       | 38.2                  | 13.6                | 1.47               |
| 12.1                     | 38.2                  | 13.7                | 1.47               |
| 12.2                     | 38.1                  | 13.8                | 1.44               |
| 12.3                     | 38.2                  | 13.8                | 1.41               |
| 12.4                     | 38.2                  | 13.9                | 1.38               |
| 12.5                     | 38.2                  | 14.0                | 1.35               |
| 12.6                     | 38.2                  | 14.0                | 1.33               |
| 12.7                     | 38.4                  | 13.9                | 1.29               |
| 12.8                     | 38.4                  | 14.0                | 1.29               |
| 12.9                     | 38.4                  | 14.0                | 1.28               |
| 13                       | 38.6                  | 13.9                | 1.28               |
| 13.1                     | 38.6                  | 14.0                | 1.32               |
| 13.2                     | 38.8                  | 13.9                | 1.36               |
| 13.3                     | 38.9                  | 13.8                | 1.41               |
| 13.4                     | 39.1                  | 13.7                | 1.45               |
| 13.5                     | 39.2                  | 13.6                | 1.51               |
| 13.6                     | 39.4                  | 13.5                | 1.56               |
| 13.7                     | 39.6                  | 13.3                | 1.61               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 13.8                     | 39.9                  | 13.2                | 1.67               |
| 13.9                     | 40.0                  | 13.0                | 1.72               |
| 14                       | 40.3                  | 12.8                | 1.76               |
| 14.1                     | 40.5                  | 12.7                | 1.80               |
| 14.2                     | 40.6                  | 12.7                | 1.83               |
| 14.3                     | 40.9                  | 12.5                | 1.86               |
| 14.4                     | 41.0                  | 12.4                | 1.87               |
| 14.5                     | 41.2                  | 12.3                | 1.83               |
| 14.6                     | 41.1                  | 12.4                | 1.75               |
| 14.7                     | 41.1                  | 12.4                | 1.69               |
| 14.8                     | 41.1                  | 12.5                | 1.65               |
| 14.9                     | 41.2                  | 12.5                | 1.64               |
| 15                       | 41.2                  | 12.5                | 1.62               |
| 15.1                     | 41.3                  | 12.5                | 1.61               |
| 15.2                     | 41.3                  | 12.6                | 1.61               |
| 15.3                     | 41.4                  | 12.5                | 1.62               |
| 15.4                     | 41.3                  | 12.7                | 1.61               |
| 15.5                     | 41.5                  | 12.6                | 1.63               |
| 15.6                     | 41.4                  | 12.7                | 1.61               |
| 15.7                     | 41.5                  | 12.6                | 1.61               |
| 15.8                     | 41.5                  | 12.7                | 1.59               |
| 15.9                     | 41.7                  | 12.6                | 1.60               |
| 16                       | 41.6                  | 12.7                | 1.59               |
| 16.1                     | 41.7                  | 12.6                | 1.59               |
| 16.2                     | 41.8                  | 12.6                | 1.63               |
| 16.3                     | 41.8                  | 12.6                | 1.59               |

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## 校准结果

Calibration Results

| 频率<br>Frequency<br>(GHz) | 天线系数<br>AF<br>dB(1/m) | 增益<br>Gain<br>(dBi) | 驻波比<br>VSWR<br>(/) |
|--------------------------|-----------------------|---------------------|--------------------|
| 16.4                     | 41.8                  | 12.7                | 1.57               |
| 16.5                     | 42.0                  | 12.6                | 1.58               |
| 16.6                     | 42.1                  | 12.6                | 1.60               |
| 16.7                     | 42.2                  | 12.5                | 1.60               |
| 16.8                     | 42.4                  | 12.3                | 1.59               |
| 16.9                     | 42.6                  | 12.2                | 1.58               |
| 17                       | 42.6                  | 12.2                | 1.57               |
| 17.1                     | 42.7                  | 12.2                | 1.53               |
| 17.2                     | 43.0                  | 12.0                | 1.49               |
| 17.3                     | 43.2                  | 11.8                | 1.45               |
| 17.4                     | 43.4                  | 11.7                | 1.42               |
| 17.5                     | 43.5                  | 11.5                | 1.38               |
| 17.6                     | 43.7                  | 11.4                | 1.32               |
| 17.7                     | 43.7                  | 11.4                | 1.25               |
| 17.8                     | 43.8                  | 11.4                | 1.21               |
| 17.9                     | 43.9                  | 11.4                | 1.20               |
| 18                       | 44.0                  | 11.3                | 1.22               |

校准结果的不确定度  
Uncertainty of calibration results  
AF/Gain  $U=0.7\text{dB}$  ( $k=2$ )

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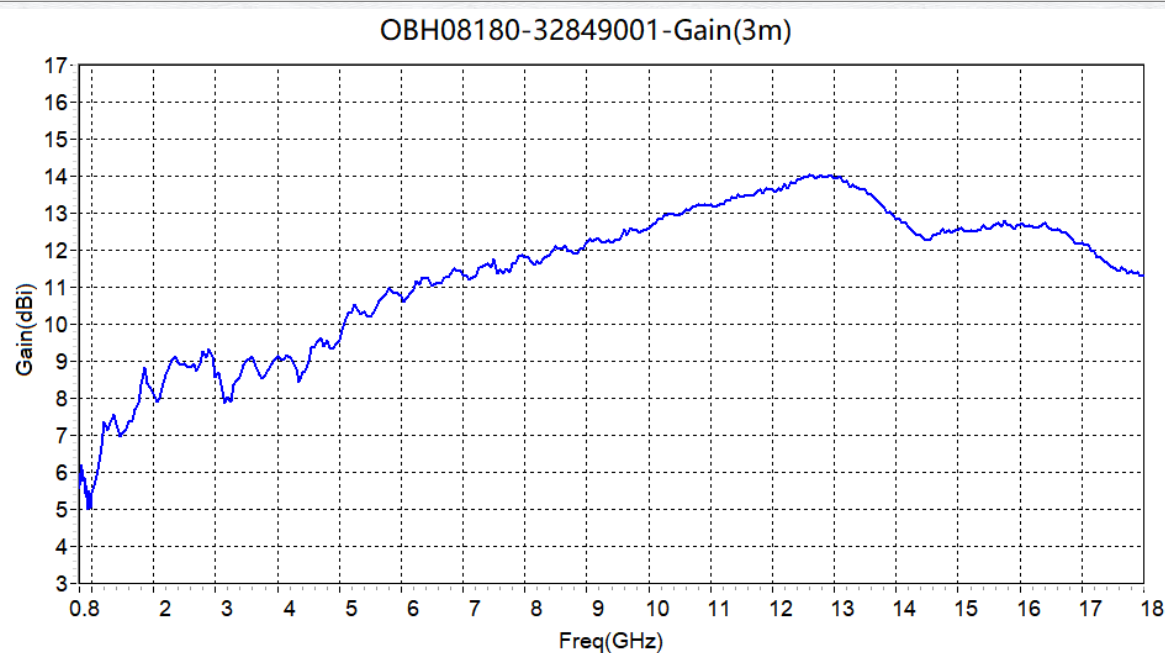
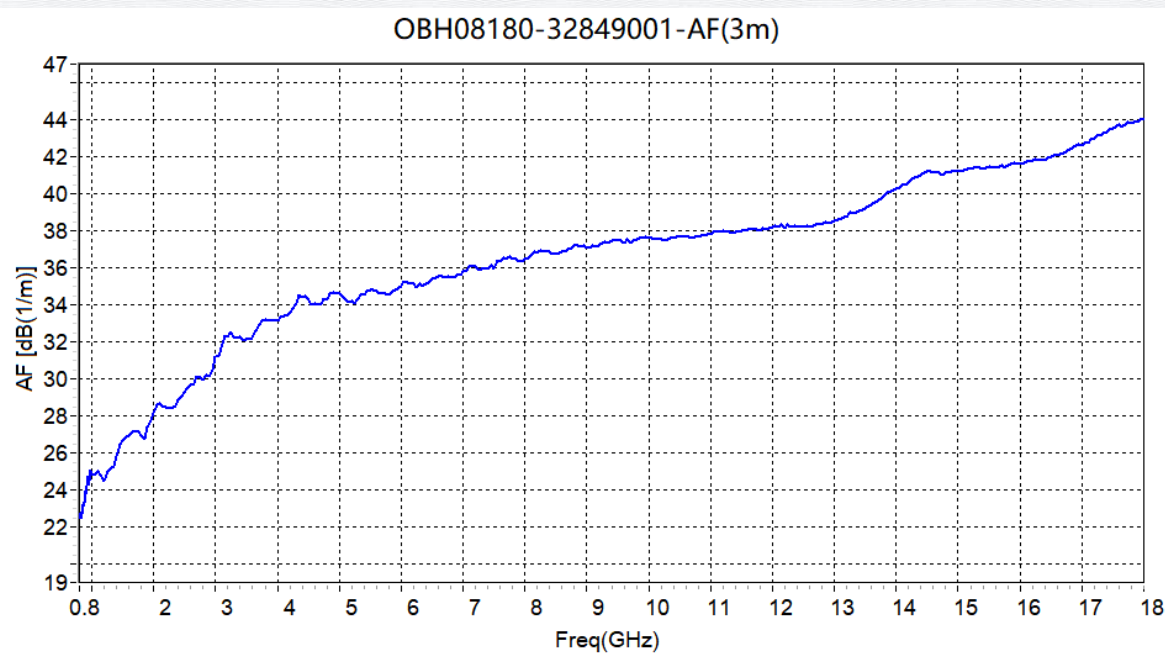
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# 校准结果

Calibration Results

校准曲线

Calibration Curve

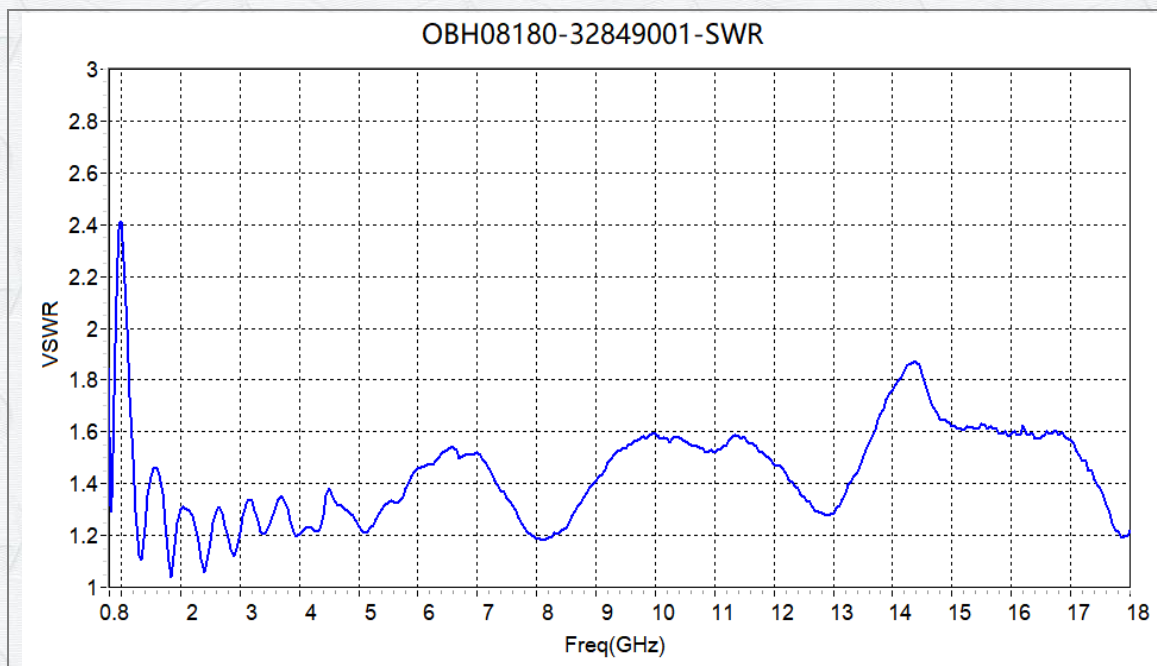




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# 校准结果

Calibration Results



建议 Suggestion:

/

声明 Statement:

1. 我院仅对加盖“中国计量科学研究院校准专用章”的完整证书负责。

NIM is ONLY responsible for the complete certificate with the calibration stamp of NIM.

2. 本证书的校准结果仅对所校准的计量器具有效。

The certificate is ONLY valid for the calibrated instrument.

3. 本证书用中英文两种语言表达，准确含义以中文为准。

The certificate is reported in both English and Chinese, with the Chinese version as standard.

校准员:

王雅龙

Calibrated by

核验员:

刘科

Checked by