

ICS 27.160
CCS K 83



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 6497-2025

Replacing GB/T 6497-1986

General rules for the calibration of terrestrial photovoltaic cells

地面用光伏电池标定的一般规定

Issued on: December 31, 2025

Implemented on: July 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB 6497-1986 "General Provisions for Calibration of Ground-based Solar Cells". Compared with GB 6497-1986, except for structural adjustments... Aside from integration and editorial changes, the main technical changes are as follows:

---The applicability of non-silicon-based photovoltaic cells, such as those using gallium arsenide, has been expanded (see Chapter 1);

---The definition of the calibration value has been changed (see Chapter 3, see Chapter 2

of the 1986 edition);

---The method for determining ground sunlight has been revised (see Appendix A, Appendix B of the 1986 edition);

---Added differential spectral responsivity calibration method and solar simulator calibration method (see Appendix A). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China. This document is under the jurisdiction of the National Technical Committee on Standardization of Solar Photovoltaic Energy Systems (SAC/TC90). This document was drafted by: China National Institute of Metrology, China Huaneng Group Clean Energy Technology Research Institute Co., Ltd., and China Electronics Technology Group Corporation. Technical Standardization Research Institute, Hechuang Testing (Jiangsu) Co., Ltd., Risen Energy Co., Ltd., Jinko Solar Co., Ltd. JA Solar Technology Co., Ltd., Trina Solar Co., Ltd., Beijing Zhuxin New Energy Co., Ltd., and Shanghai Electric Group Co., Ltd. Limited Liability Company. The main drafters of this document are: Xiong Limin, Meng Haifeng, Zhao Zhiguo, Chen Xiaoda, Wang Ganqiang, Gao Chuanlou, Zhang Ying, Liu Yafeng, Huang Ling, and Jiang Xiulin. Zhang Junchao, Yan Ping, Li Mengyuan, Zhang Yun, Li Longyun, Dong Guohuang, Xu Minwei. This document was first published in 1986, and this is its first revision.

With the development and updating of photovoltaic cell manufacturing processes, related metrology technologies, and international and domestic standards, the technical specifications stipulated in GB 6497-1986 have become increasingly important. The language, content, and methods are no longer sufficient to meet the needs and urgently require updates to promote the healthy development of the photovoltaic industry. Internationally, ground-mounted Class I standard photovoltaic power... Cell calibration methods are generally classified into three types: differential spectral responsivity calibration, ground-based sunlight calibration, and solar simulator calibration. Differential spectral responsivity calibration... The response calibration method is not affected by external natural environmental conditions, the calibration work is convenient and practical, and it can achieve a high level of measurement uncertainty. Ground-based solar calibration methods are divided into total radiation calibration and direct radiation calibration. Both require good sunlight conditions and are susceptible to weather and other natural factors. The calibration process is subject to significant limitations and influences, requiring the selection of appropriate meteorological conditions and the implementation of corrections to obtain accurate and reliable calibration results. Solar simulator calibration. The method is unaffected by natural environmental factors such as weather, but is limited by factors such as the mismatch between the solar simulator spectrum and the AM1.5G standard spectrum. This document... This document covers the three methods mentioned above, and includes their specific requirements and data processing details in the appendix, providing a standard for Class I photovoltaic cells used in my country's ground-mounted applications.

The calibration process provides reference and guidance. In actual calibration work, the appropriate method can be selected based on the laboratory's own conditions. GB/T 6497 aims to calibrate Class I standard photovoltaic cells for ground use, obtaining their short-circuit current values under standard test conditions, i.e., calibration. These values are crucial for the traceability of downstream parameters in ground-mounted photovoltaic systems. This revision expands the scope of application, updates key definitions, and adds new values. my country's independently traceable and internationally recognized differential spectral response calibration method has improved upon ground-based sunlight calibration methods, reflecting my country's technological advancements. This document, while considering the current situation and future development, is both practical and instructive. It outlines the research, screening, and standardization of ground-mounted standard photovoltaic cells in my country. It is of great significance in terms of definition and application. General provisions for calibration of ground-mounted photovoltaic cells

1 Scope

GB/T 6497-2025 is the Chinese national standard covering calibrating the reference cell used on the ground - the traceability chain from a primary standard to the working cell in a flash tester, and the spectral mismatch correction without which every efficiency figure would be wrong. It replaces GB/T 6497-1986, a standard thirty-nine years old, with the aerospace reference cell standard GB/T 6492-2025. It was issued on 31 December 2025 and has been in force since 1 July 2026, replacing GB/T 6497-1986. The document is under the responsibility of the Ministry of Industry and Information Technology. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the equipment requirements, calibration methods, and calibration procedures for calibrating ground-mounted Class I standard photovoltaic cells. This document applies to the calibration of ground-based photovoltaic cells, including silicon-based and gallium arsenide-based cells.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 2297 Terminology for Solar Photovoltaic Energy Systems

GB/T 6495.2 Photovoltaic devices - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 2297 and the following terms and definitions apply to this document.

3.1 A standard device manufactured using prescribed methods, whose values are not derived from other photovoltaic cells, used for periodic calibration of secondary standard photovoltaic cells.

Note. In IEC 60904-4, the general term is primary reference.

3.2 The standard test conditions for ground-mounted photovoltaic cells are AM1.5G standard solar spectral irradiance, with a total solar irradiance of 1000 W/m^2 . The calibrated temperature of the volt-volt battery is 25°C .

3.3 calibration value The short-circuit current value of a standard photovoltaic cell under standard test conditions.

4 Instruments and Equipment

4.1 General Requirements The instruments and equipment should be calibrated by a nationally accredited metrology institution and be within their validity period.

8 Measurement of spectral response of photovoltaic devices

GB/T 6495.10 Photovoltaic devices - Part

10 Measurement methods for linear correlation and linearity characteristics

GB/T 46982-2025 Photovoltaic devices - Temperature and irradiance correction methods for IV characteristics (IEC 60891.2021, IDT)