

ICS 27.160
CCS K 83



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

GB/T 6495.1-2025

Replacing GB/T 6495.1-1996

**Photovoltaic devices - Part 1: Measurement of photovoltaic
current-voltage characteristics**

光伏器件 第1部分：光伏电流-电压特性的测量
光伏器件 第1部分：光伏电流-电压特性的测量

(English Translation)

Issued on: December 31, 2025

Implemented on: July 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Preface

Introduction

1 Scope

2 Normative References

3 Terms and Definitions

4 General Requirements

5 Instruments and Equipment

6 Measurements taken under natural sunlight.

7 Measurements taken under simulated sunlight.

8 Data Analysis

9 Test Report

Appendix A (Informative) Measurement of Device Area

Appendix B (Informative) Photovoltaic Devices with Capacitive Characteristics IV.
Characteristic Measurement

Appendix C (Informative) Measurement of Current-Voltage Characteristics of
Photovoltaic Devices under Dark-State Conditions (Dark-State IV Characteristic
Measurement)

Appendix D (Informative) The Influence of Spatial Non-uniformity of Irradiance on IV
Curve Parameters

References

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 is Part 1 of GB/T 6495 "Photovoltaic Devices". GB/T 6495 has already published the following parts.

---Part 1: Measurement of Photovoltaic Current-Voltage Characteristics;

---Part 1-1.Measurement of Current-Voltage Characteristics of Multijunction Photovoltaic
Devices;

---Part 2: Requirements for Standard Photovoltaic Devices;

- Part 3: Measurement Principle of Ground-Based Photovoltaic Devices Based on Standard Spectral Irradiance Data;
- Part 5: Determining the Equivalent Cell Temperature (ECT) of Photovoltaic Devices Using the Open-Circuit Voltage Method;
- Part 7: Calculation Method for Spectral Mismatch Correction in Photovoltaic Device Measurements;
- Part 8: Measurement of the Spectral Response of Photovoltaic Devices;
- Part 8-1.Measurement of the Spectral Response of Multijunction Photovoltaic Devices;
- Part 9: Characteristic Classification of Solar Simulators;
- Part 10: Methods for measuring linear correlation and linearity;
- Part 11: Initial light-induced degradation test method for crystalline silicon solar cells.

This document supersedes GB/T 6495.1-1996 "Photovoltaic Devices - Part 1: Measurement of Photovoltaic Current-Voltage Characteristics", and is consistent with...

Compared with GB/T 6495.1-1996, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- a) The scope has been changed (see Chapter 1, Chapter 1 of the 1996 edition);
- b) The chapter on "General Measurement Requirements" has been revised, adding sections on overview, stabilization, and reporting conditions (see Chapter 4, Chapter 2 of the 1996 edition);
- c) Added instruments and meters (see Chapter 5);
- d) The requirements for measurements under natural sunlight have been changed, and a detailed description of the measurement process has been added (see Chapter 6, Chapter 3 of the 1996 edition);
- e) The measurements under steady-state simulated sunlight and the measurements under pulsed simulated sunlight are combined into one chapter, and the process of simulating sunlight measurement is added.

A detailed description of the process (Chapter 7, Chapters 4 and 5 of the 1996 edition);

f) A chapter on data analysis has been added, clarifying the requirements for processing test results (see Chapter 8);

g) The content of the "Test Report" section has been changed (see Chapter 9, Chapter 6 of the 1996 edition).

This document is equivalent to IEC 60904-1:2020 "Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics".

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).

Introduction

GB/T 6495 proposes methods for measuring the performance of photovoltaic devices, as well as standards, value transfer, and result correction related to performance measurement.

The requirements for the classification of testing equipment, etc., have positive guiding significance for the performance measurement of photovoltaic devices such as photovoltaic cells and photovoltaic modules.

GB/T 6495 is proposed to consist of the following parts.

---Part 1: Measurement of Photovoltaic Current-Voltage Characteristics. The purpose is to define the basic requirements for measuring the IV curve of photovoltaic devices.

---Part 1-1.Measurement of Current-Voltage Characteristics of Multijunction Photovoltaic Devices. The purpose is to specify the measurement of the IV characteristics of multijunction photovoltaic devices.

Quantification method.

---Part 1-2.Measurement of Current-Voltage Characteristics of Bifacial Photovoltaic Devices. The purpose is to specify the IV characteristic measurement of bifacial photovoltaic modules.

Quantification method.

---Parts 1-3.Measurement of Current-Voltage Characteristics of Curved Photovoltaic Devices. The purpose is to specify the measurement of the IV characteristics of curved photovoltaic devices.

Quantification method.

---Part 2: Requirements for Standard Photovoltaic Devices. The purpose is to specify the requirements for standard photovoltaic devices.

---Part 3: Measurement Principles of Ground-Based Photovoltaic Devices Based on Standard Spectral Irradiance Data. The aim is to provide standard photovoltaic irradiance data.

Degree data.

---Part 4: Procedures for Establishing Standard Photovoltaic Device Calibration Traceability. The purpose is to establish traceability for photovoltaic device calibration.

program.

---Part 5: Determining the Equivalent Cell Temperature (ECT) of Photovoltaic Devices Using the Open-Circuit Voltage Method. The aim is to define the equivalent cell temperature (ECT) of photovoltaic devices.

Method for testing the open-circuit voltage of battery temperature.

---Part 7: Calculation Method for Spectral Mismatch Correction in Photovoltaic Device Measurements. The purpose is to specify the calculation method for spectral mismatch correction.

---Part 8: Measurement of the Spectral Response of Photovoltaic Devices. The purpose is to specify the methods for measuring the spectral response.

---Part 8-1: Measurement of the Spectral Response of Multijunction Photovoltaic Devices. The purpose is to specify the measurement method for the spectral response of multijunction photovoltaic devices.

method.

---Part 9: Classification of Solar Simulator Characteristics. The purpose is to specify the classification requirements for solar simulators used to measure photovoltaic devices.

---Part 10: Methods for Measuring Linear Correlation and Linearity Characteristics. The aim is to define the linearity characteristics of photovoltaic devices and their testing.

method.

---Part 11: Test Method for Initial Light-Induced Degradation of Crystalline Silicon Solar Cells. The purpose is to specify the initial light-induced degradation test method for crystalline silicon solar cells.

Attenuation test method.

---Part 12: Measurement methods for the current-voltage (IV) characteristics of perovskite photovoltaic cells and modules. The purpose is to specify the measurement methods for the current-voltage (IV) characteristics of perovskite photovoltaic cells and modules.

Methods for measuring the IV characteristics of voltage-voltage devices.

---Part 13: Electroluminescence of Photovoltaic Modules. The purpose is to specify the testing methods for the electroluminescence of photovoltaic modules.

Note: The correspondence between each part and the IEC 60904 series of international standards