
Draft Jamaican Standard

Specification

for

Photovoltaic devices –

Part 1: Measurement of photovoltaic current-voltage characteristics



BUREAU OF STANDARDS JAMAICA

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Draft Jamaican Standard

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Jamaican Standards establish requirements in relation to commodities, processes and practices, but not purport to include all the necessary provisions of a contract.

The attention of those using this standard specification is called to the necessity of complying with any relevant legislation.

Amendments

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National Foreword

This standard is an adoption and is identical to **ISO IEC 60904-1: 2020** Photovoltaic devices- Part 1: Measurement of photovoltaic current-voltage characteristics published by International Electrotechnical Commission (IEC).

Scope of the Standard

This part of IEC 60904 describes procedures for the measurement of current-voltage characteristics (*I-V* curves) of photovoltaic (PV) devices in natural or simulated sunlight. These procedures are applicable to a single PV solar cell, a sub-assembly of PV solar cells, or a PV module. They are applicable to single-junction mono-facial PV devices. For other device types, reference is made to the respective documents, in particular for multi-function devices to IEC 60904-1-1 and for bifacial devices to IEC 60904-1-2. Additionally informative annexes are provided concerning area measurement of PV devices (Annex A), PV devices with capacitance (Annex B), measurement of dark current-voltage characteristics (dark *I-V* curves) (Annex C) and effects of spatial non-uniformity of irradiance (Annex D).

NOTE The methods provided in this document can also be used as guidance for taking *I-V* curves of PV arrays. For on-site measurement refer to IEC 61829.

This document is applicable to non-concentrating PV devices for use in terrestrial environments, with reference to (usually but not exclusively) the global reference spectral irradiance AM1.5 defined in IEC 60904-3. It may also be applicable to PV devices for use under concentrated irradiation if the application uses direct sunlight and reference is instead made to the direct reference spectral irradiance AM1.5d in IEC 60904-3.

The purposes of this document are to lay down basic requirements for the measurement of *I-V* curves of PV devices, to define procedures for different measuring techniques in use and to show practices for minimising measurement uncertainty. It is applicable to the measurement of *I-V* curves in general. *I-V* measurements can have various purposes, such as calibration (i.e., traceable measurement with stated uncertainty, usually performed at standard test conditions) of a PV device under test against a reference device, performance measurement under various conditions (e.g. for device temperature and irradiance) such as those required by IEC 60891 (for determination of temperature coefficients or internal series resistance), by IEC 61853-1 (power rating of PV devices) or by IEC 60904-10 (for determination of output's linear dependence and linearity with respect to a particular test parameter). *I-V* measurements are also important in industrial environments such as PV module production facilities, and for testing in the field. Further guidance on *I-V* measurements in production facilities is provided in IEC TR 60904-14.

The actual requirements (e.g., for the class of solar simulator) depend on the end-use. Other standards referring to IEC 60904-1 can stipulate specific requirements. Where those requirements are in conflict with this document, the specific requirements take precedence.

Where the words 'International Standard' appear, referring to this standard, they should be read as 'Jamaican Standard'.

Where reference is made to informative and normative annexes the following definitions should be noted:

- Informative Annex – gives additional information intended to assist in the understanding or use of the document. They do not contain requirements.
- Normative Annex – gives provisions additional to those in the body of a document. They contain requirements.

Users should note that all standards undergo revision from time to time and that any reference made herein to any standard implies its latest edition, unless otherwise stated.

This standard is voluntary.

Acknowledgement

Acknowledgement is made to the International Electrotechnical Commission (IEC) for permission to adopt IEC 60904-1: 2020.

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