
Draft Jamaican Standard

Specification

for

Photovoltaic devices –

**Part 7: Computation of the spectral mismatch correction for
measurements of photovoltaic devices**



BUREAU OF STANDARDS JAMAICA

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Draft Jamaican Standard

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DJS IEC 60904-7: 2023

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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

No.	Date of Issue	Remarks	Entered by and date

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National Foreword

This standard is an adoption and is identical to **ISO IEC 60904-7: 2019** Photovoltaic devices- Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices published by International Electrotechnical Commission (IEC).

Scope of the Standard

This part of IEC 60904 describes the procedure for correcting the spectral mismatch error introduced in the testing of a photovoltaic device, caused by the mismatch between the test spectrum and the reference spectrum (e.g., A.M1.5 spectrum) and by the mismatch between the spectral responsivities (SR) of the reference device and of the device under test and therewith reduce the systematic uncertainty. This procedure is valid for single-junction devices but the principle may be extended to cover multi-junction devices.

The purpose of this document is to give guidelines for the correction of the spectral mismatch error, should there be a spectral mismatch between the test spectrum and the reference spectrum as well as between the reference device SR and the device under test SR. The calculated spectral mismatch correction is only valid for the specific combination of test and reference devices measured with a particular test spectrum.

Since a PV device has a wavelength-dependent spectral responsivity, its performance is significantly affected by the spectral distribution of the incident radiation, which in natural sunlight varies with several factors such as location, weather, time of year, time of day, orientation of the receiving surface, etc., and with a solar simulator varies with its type and conditions. If the irradiance is measured with a thermopile-type radiometer (that is not spectrally selective) or with a PV reference device (IEC 60904-2), the spectral irradiance distribution of the incoming light must be known to make the necessary corrections to obtain the performance of the PV device under the reference spectral irradiance distribution defined in IEC 60904-3.

If a reference PV device or a thermopile type detector is used to measure the irradiance, then, following the procedure given in this document, it is possible to calculate the spectral mismatch correction necessary to obtain the short-circuit current of the device under test under the reference spectral irradiance distribution in IEC 60904-3 or any other reference spectrum. If the reference PV device has the same relative spectral responsivity as the device under test then the reference device automatically takes into account deviations of the measured spectral irradiance distribution from the reference spectral irradiance distribution, and no further correction of spectral mismatch errors is necessary. In this case, location and weather conditions are not critical when the reference device method is used for performance measurements under natural sunlight. Also, for identical relative SRs, the spectral classification of the simulator is not critical for measurements with solar simulators.

If the performance of a PV device is measured using a known spectral irradiance distribution, its short-circuit current at any other spectral irradiance distribution can be computed using the spectral responsivity of the PV device under test.

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 60904-7: 2019**.