

SolarMax Energy Systems

Photovoltaic module bifaciality standard requirements



Overview

This part of IEC 60904 describes procedures for the measurement of the current-voltage (I-V) characteristics of bifacial photovoltaic devices in natural or simulated sunlight. It is applicable to single PV cells, sub-assemblies of such cells or entire PV modules. Do bifacial PV modules need a power rating method?

In response to the strong demand for an appropriate power rating method for bifacial PV modules, the international standard IEC 60904-1-2 has been proposed, which describes the test methods and additional requirements for the I-V characterization.

Do bifacial PV modules need to be electrically stabilized?

In accordance with IEC 61215-1,-1-1,-2 standards, PV modules should be electrically stabilized before any further measurement. As bifacial PV devices are mostly PERT, PERC and HJT technology based, issues such as light-induced degradation (LID) exist and should not be neglected.

What are bifacial PV modules?

The global PV industry is experiencing a boom in bifacial PV modules. Coming with extra energy gain from the rear side, bifacial PV modules are finding themselves with versatile and promising application possibilities in many fields, from building-integrated photovoltaics to utility-scale power plants.

What is the power bifaciality coefficient of a photovoltaic module?

In the light of the results obtained, the power bifaciality coefficient of a photovoltaic module, measured experimentally in real operating conditions and translated to STC, matches relatively well the value indicated by the manufacturer in its datasheet.

Are bifacial PV modules better than monofacial solar panels?

Compared with monofacial PV modules, energy yields of around 10% higher

(or even more) from bifacial modules in the field have been consistently reported by various parties [2,3]. Such increases in yield can considerably reduce the levelized cost of energy. Bifacial PV technology is not a new concept in the PV community.

Can a solar simulator be used to measure bifacial PV devices?

As described in IEC 60904-1-2, for single-sided illumination measurements of bifacial PV devices, a solar simulator (as defined in IEC 60904-9) with adjustable irradiance level has to be used for the I-V characterisation.

Photovoltaic module bifaciality standard requirements



Power rating and qualification of bifacial PV modules

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Standards Procedures for Bifacial Parameters Measurements and

The procedures for the measurement of the current-voltage (I-V) characteristics and bifaciality parameters of bifacial photovoltaic devices are analytically described in the IEC 60904-1-2 ...



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IEC 60904-1-2

This part of IEC 60904 describes procedures for the measurement of the current-voltage (I-V) characteristics of bifacial photovoltaic devices in natural or simulated sunlight. It is applicable ...

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Evaluation of the bifaciality coefficient of bifacial photovoltaic

ABSTRACT: Among the parameters that define a bifacial photovoltaic module, the bifaciality coefficients indicate the rear and front side ratio of the most representative IV curve points of a ...

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IEC TS 60904-1-2:2024 Photovoltaic devices

IEC TS 60904-1-2:2024 describes procedures for the measurement of the current-voltage (I-V) characteristics of single junction bifacial photovoltaic devices in natural or simulated sunlight. It ...

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What Defines Bifacial Module Power Generation ...

Furthermore, the IEC standard also defines "Bifacial Standard Irradiance (BSI)" for assessing bifacial reliability. Here, the module front ...

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Performance analysis and comparison between bifacial and ...

This paper analyses and compares the



performance between a bifacial and a monofacial PV system based on the tests conducted at Heriot-Watt University, UK. The ...

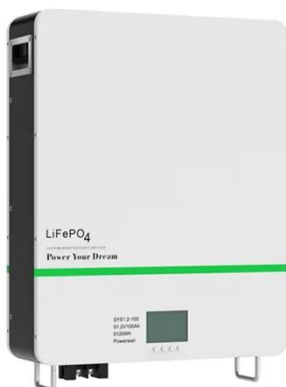
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IEC 61215 Certification Testing, PV specialized

IEC 61215 is the standard which indicates the requirements for the design approval and qualification process and type approval of terrestrial PV modules suitable for long-term ...



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Bifacial PV Characterization and Rating Standards

Through simulation and experiment, we are investigating back-side irradiance conditions that are appropriate for the power rating of bifacial modules. We are ...

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Evaluation of the bifaciality coefficient of bifacial photovoltaic

ABSTRACT Among the parameters that

define a bifacial photovoltaic module, the bifaciality coefficients indicate the rear and front side ratio of the most representative IV curve points of a

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Understanding Bifacial Photovoltaic's Potential

Bifacial market needs (~2016) The PV industry is set for rapid uptake of bifacial PV if key barriers are eliminated accurate performance models reliability standards and STC rating of bifacial ...

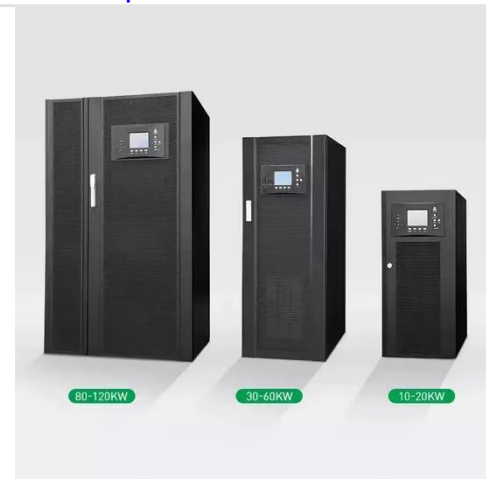
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IEC 61215-1:2021

This part of IEC 61215 lays down IEC requirements for the design qualification and type approval of terrestrial photovoltaic (PV) modules suitable for long-term operation in general open-air

...

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Comprehensive study on the efficiency of vertical bifacial photovoltaic

The VBPV system, characterized by its vertical orientation and the use of high-



efficiency Heterojunction cells, introduces a novel concept diverging from traditional solar ...

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Evaluation of the bifaciality coefficient of bifacial photovoltaic

For such purpose, an outdoor campaign was performed to experimentally measure the maximum power bifaciality coefficient of two modified bifacial modules that resemble a rear ...



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Bifacial PV Characterization and Rating Standards

Through simulation and experiment, we are investigating back-side irradiance conditions that are appropriate for the power rating of bifacial modules. We are also field testing proposed ...

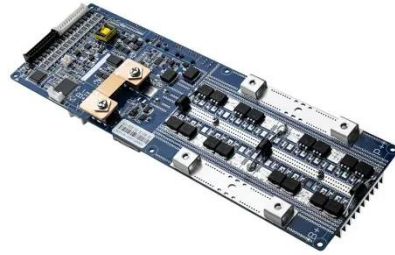
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Performance characteristics of bifacial PV modules and ...

Validation of output power specification

is part of IEC 61215 product qualification testing. Production tolerances of rear performance are typically higher compared to front side. How to ...

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What Defines Bifacial Module Power Generation Performance?

Furthermore, the IEC standard also defines "Bifacial Standard Irradiance (BSI)" for assessing bifacial reliability. Here, the module front continues to receive 1000W/m^2 , but the ...

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Understanding Bifacial Photovoltaic's Potential

1-axis tracker validation is underway at NREL and is showing good bifacial annual energy gain of 6.5% and 9% for PERC and Si-HJT, respectively. We are working with industry to update ...

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Complete Guide to Bifacial Solar Panels

Bifacial Solar Panel Performance:



Measuring and Maximizing Energy Output Understanding bifacial panel performance requires different metrics than traditional solar ...

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Performance of bifacial PV modules under different operating ...

These modules collect solar radiation on both front and rear sides, providing gains in electricity production compared to traditional monofacial modules. The market acceptance and quality ...

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Standards Procedures for Bifacial Parameters ...

The procedures for the measurement of the current-voltage (I-V) characteristics and bifaciality parameters of bifacial photovoltaic devices are analytically ...

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IEC TS 60904-1-2:2024

IEC TS 60904-1-2:2024 describes procedures for the measurement of the current-voltage (I-V) characteristics of

single junction bifacial photovoltaic devices in natural or simulated sunlight.
It ...

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Analysis of requirements, specifications and regulation of BIPV

The standard defines the basic safety test requirements and additional tests that are a function of the PV module end-use applications. Test categories include general inspection, electrical ...

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What Is Heterojunction Technology (HJT solar) and ...

Discover how Heterojunction Technology (HJT) is shaping the future of solar PV panels--and why rigorous inspection is crucial for long-term performance and ...

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IEC TS 60904-1-2:2024

The requirements for measurement of I-V characteristics of standard (monofacial) PV devices are covered by



IEC 60904-1, whereas this document describes the additional requirements for the ...

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Both sides now: Optimal bifaciality with silicon

This simple approach was taken, whatever the actual parameters determining the bifaciality factor, such as system design (module tilt and elevation above ground, number of modules ...



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