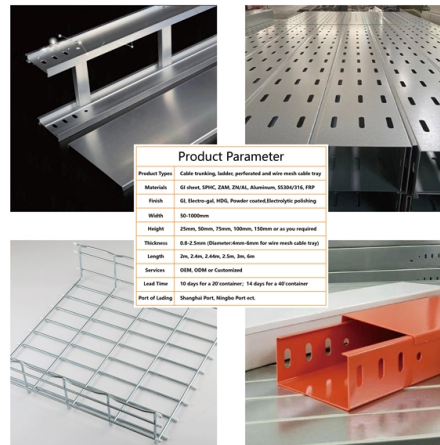


Busbarless connection mainly includes



AI Overview

Busbarless (OBB/ZBB) connections eliminate front-side busbars on solar cells, using fine gridlines and ribbons to collect current, improving efficiency and reducing material costs.

Overview Busbars are metallic lines on solar cells that collect and transport electrical current. Traditional cells use multiple busbars (2BB to 21BB) to reduce series resistance, but they occupy surface area, causing shading and reducing light absorption. Busbarless technology, also called OBB or ZBB, removes these busbars entirely. Instead, ribbons or wires collect current directly from the fine gridlines, which reduces shading, improves the cell-to-module (CTM) efficiency, and lowers silver usage by 30-50% per cell.

Electrical and Mechanical Considerations Without busbars, contacting the fine gridlines becomes more complex. Each grid finger must be individually contacted, often requiring independent current and voltage contacts to minimize resistive losses and ensure accurate performance measurement. Techniques include:

- Wire-embedded EVA sheets:** Cells are laminated with SnBiAg wires embedded in EVA, achieving low contact resistivity and high efficiency (~19.55%) at optimized lamination temperatures.
- Electrically Conductive Adhesives (ECA):** Pads of ECA are applied to each finger, decoupling electrical contact from mechanical adhesion. This allows optimization of both conductivity and adhesion while reducing material usage.
- Metal connecting wires:** In busbar-free modules, metal wires are soldered to the cell gridlines, simplifying alignment and reducing the risk of unstable connections.

Advantages

- Higher Efficiency:** Less shading from busbars increases light absorption and improves CTM ratio.
- Material Savings:** Reduced silver paste usage lowers production costs.
- Compatibility with Thin Wafers:** Flexible connection methods allow the use of thinner silicon wafers, further reducing costs.
- Enhanced Stability:** Multiple contact points reduce losses from microcracks and improve module reliability.

Applications Busbarless technology is compatible with ad...

Article Content

0BB busbarless HJT module was successfully launched, with a power

Huasheng New Energy 0BB technology is mainly achieved through welding and dispensing, which involves laying welding strips, adding adhesive points, and then UV curing. Its advantages include no

Bussard Busbarless solar cells with passivated contacts for Next Gen ...

In combination with a busbarless metallization and interconnection concept, this is a very promising approach for the next generation of solar cell and module technology.

Multi-Wire Interconnection of Busbarless Solar Cells with Embedded ...

The wire was mainly coated with a SnPb solder. In this study, the lamination process was applied at a low temperature of 200 C or less for interconnection between the busbarless cell and the wire.

(PDF) Multi-Wire Interconnection of Busbarless Solar Cells with ...

This technology increases the active area for photocurrent generation because the cells are connected in a busbar-less structure, and high-power, high-efficiency modules can be manufactured.

Project “BUSSARD” – a holistic development of high-efficiency solar ...

Within this work, we evaluate the compatibility of the Tape Solution approach with busbarless TOPCon cells and compare the results to established technologies for such cells namely Smart Wire

Fraunhofer ISE develops solder-free aluminum interconnection tech

The device is described in the paper FoilMet-Interconnect: Busbarless, electrically conductive adhesive-free, and solder-free aluminum interconnection for modules with shingled solar

FoilMet®-Interconnect: Busbarless, electrically conductive adhesive ...

The fingers connect the emitter through the front side passivation with the busbar forming the front screen-printed Ag electrode. The rear electrode is formed by several Ag pads or a single

Assessing current-voltage measurements of busbarless solar cells

For measuring the current-voltage (I-V) characteristics of busbarless solar cells, there is a certain degree of freedom in the choice of the contactin

Challenges for Soldering Interconnection pushed by High Efficiency ...

ABSTRACT: The solder interconnection to connect solar cells in series is a key process for the manufacturing of reliable high-performance solar modules. The fast development of the cell

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Disclosed are a busbar-free solar photovoltaic module and a manufacturing method therefor, relating to the technical field of solar photovoltaic equipment manufacturing.

Busbarless cells and the GridTouch measurement, the

Download scientific diagram | Busbarless cells and the GridTouch measurement, the SWCT concept and bifacial record module for 60 and 72 SHJ cells at 1 Sun. from

What is 0 Busbar (0BB) solar Cell Technology?

To address these issues, 0 Busbar (0BB) technology was developed. This technology eliminates busbars, reduces the use of silver paste, and increases the light-receiving area of the

Lifetime Analysis of Bifacial-Ready Contacting of Busbarless and ...

In our contribution, we evaluate two variants of a bifacial-ready contacting solution for busbarless and multibusbar solar cells with regard to their lifetime and the effect of repeated

Interconnection of busbar-free back contacted solar cells by laser ...

These modules are equipped with back- contacted cells connected to an interconnection foil by means of electrically conductive adhesives. The interconnection foil is a modification of

Decoupling of electrical contact and mechanical adhesion for

For standard IBC cells busbars are printed perpendicular to the fingers and the insulation pads. Printing on the busbars levels the topology and creates a relatively flat surface on the busbar. In a busbarless

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A middle battery piece, and adjacent battery pieces are electrically connected through metal connecting lines. The manufacturing method of the new busbarless solar photovoltaic module according to claim

Why Busbar-less PV Panels are Revolutionising Solar

Discover the 7 key benefits of busbar-less PV panels. These panels offer enhanced performance, better heat dissipation, and a sleek aesthetic.

Progress in Interconnection of Busbar-less Solar Cells by Means of ...

In this work we focus on the optimization of busbar-less front side metallization grids to improve performance of cells interconnected by conductive g

Multi-wire Interconnection of Busbar-free Solar Cells

We find the following factors to be crucial for the MBB-interconnection process: a homogeneous radiation field, a process-adapted down-holder device, a homogeneous wire coating,

Accurate Measurement of Busbarless Silicon solar cells

Busbarless solar cells become more and more important Measurement of current-voltage (I-U) characteristics of busbarless cells Contacting of grid fingers only Different setups for measurement

Interconnection of busbar-free back contacted solar cells by laser ...

We present a module integration process for aluminum metalized, busbar-free back-junction back-contact solar cells by means of laser welding. Our proof-of-concept module has a fill

FoilMet®-Interconnect: Busbarless, electrically conductive adhesive ...

Two different ways to produce shingle strings with the connections described above were examined. In the first configuration, two cells are placed on top of each other with their front sides ...

MBB vs. OBB Solar Cell Technologies | Shading Tolerance, Silver

OBB removes the printed busbars from the cell surface. Instead, the current is collected through dense wires, conductive adhesive, SmartWire-type interconnection, welding-plus-adhesive reinforcement,

(PDF) Multi-wire Interconnection of Busbar-free Solar Cells

The interconnection of busbar-free solar cells by multiple wires is a simple and evolutionary concept to lower the cost of PV modules by reducing silver consumption for the front

Contact Us

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