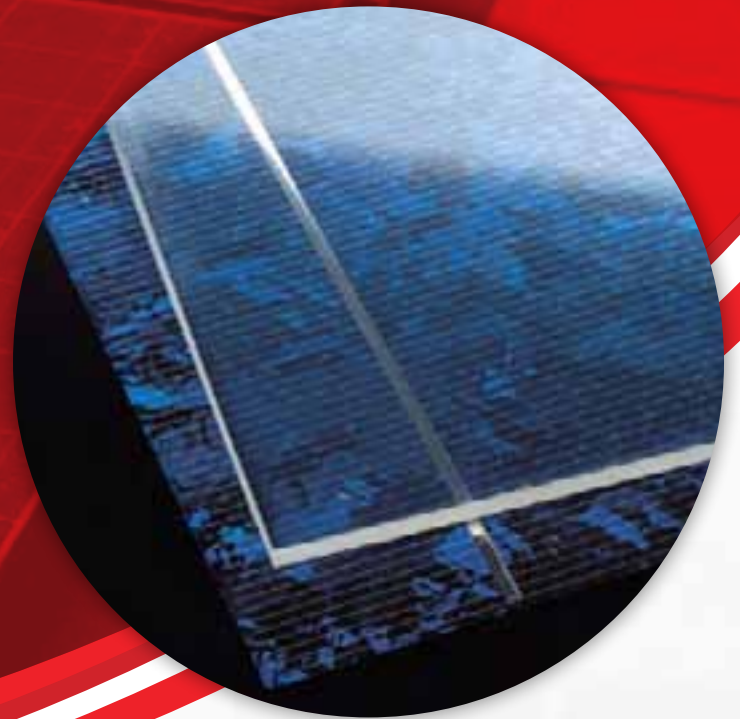
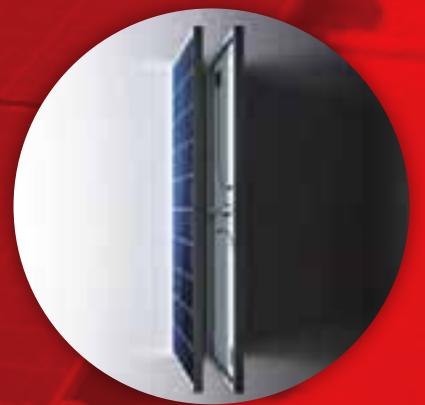


Photovoltaic Modules



Product Brochure



Mitsubishi Electric is a world leader in photovoltaic power and renewable energy systems.

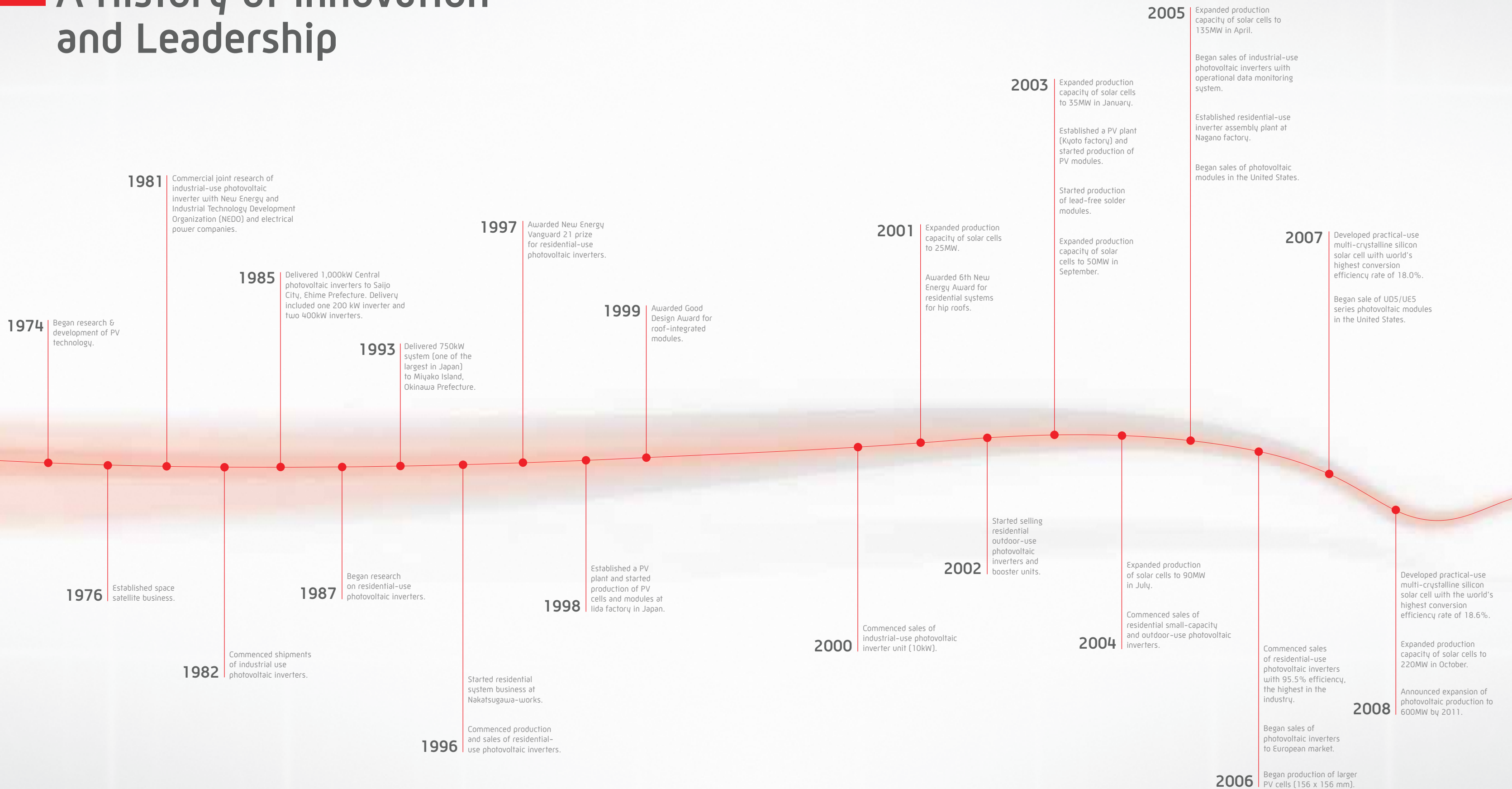
Rising energy costs, advances in technology and growing consumer awareness about climate change have created a growing market for renewable energy technologies. Photovoltaic technology delivers clean electricity to homes and businesses around the world allowing customers to hedge against rising energy costs and take control of their energy future. Mitsubishi Electric believes using clean energy is a fundamental aspect of living in harmony with our environment.

For more than 34 years, Mitsubishi Electric has been a key player in the photovoltaic industry. In the 1970s, our PV technology was used in the space business and today our PV modules are used worldwide. Our continual research and development efforts have allowed us to stay on the cutting edge, delivering a high-performance, ultra reliable product to residences, businesses, power generation plants, schools, factories, agricultural facilities and more.

High performance is the hallmark of Mitsubishi Electric. Our photovoltaic modules are engineered and manufactured to meet the highest quality standards and are then tested and certified by third parties who confirm their power output and durability. Our focus on innovation drives us to constantly search for better ways to deliver great products and peace of mind to our customers.



A History of Innovation and Leadership

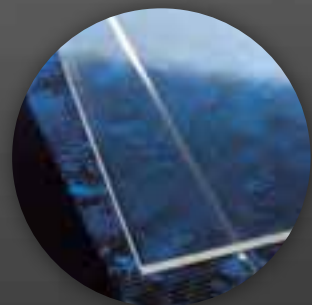
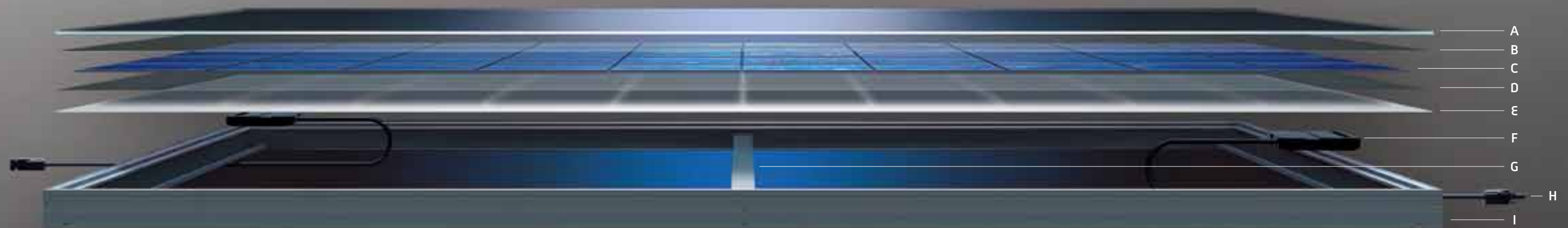


Mitsubishi Electric Photovoltaic Modules

Combining more than 34 years of photovoltaic research and development with worldwide leadership in electrical and electronics manufacturing.

Eco-friendly Features

- Lead-free solder
- ISO 14001 certified manufacturing
- Recyclable steel pallets
- Less cardboard packaging per module



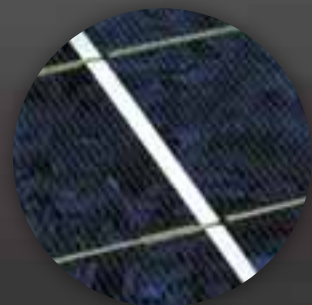
A - High-transmittance Glass

High-transmittance tempered glass allows more light to reach the solar cells, increasing efficiency.



B/D - EVA

Creates a tight seal between the solar cells, the glass, and the back film.



C - String of Cells

Straight tabs help improve the long-term reliability by reducing stress on the tabs.



E - Back Film

Increases weather resistance and aids in light absorption.



F - Junction Box

Triple-layer structure junction box with potting material, metal barrier cover and resin cover protects against combustion, water, and fire hazards.



G - Protection Bar

Added protection bar increases stability of frame for heavy external loads like snow, ice, water, and wind.



H - Connectors

Mechanical locking connectors ease installation and ensure connections are safe and secure.



I - Frame

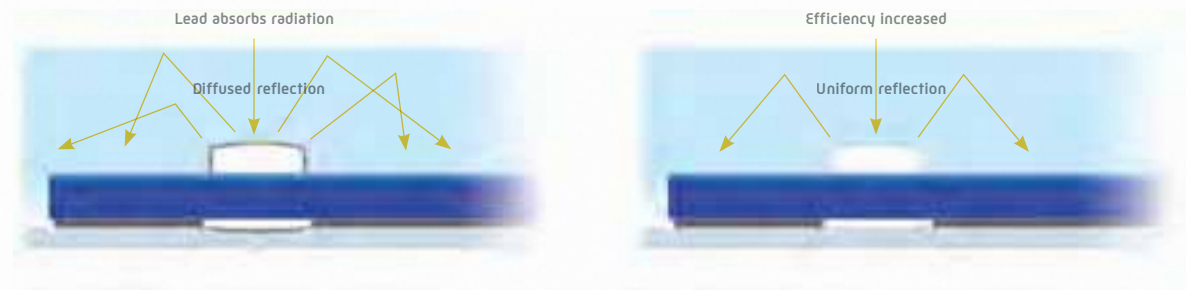
Anodized frame ensures long-term corrosion resistant under the most extreme environmental conditions.

High Efficiency Cells

Our high-efficiency polycrystalline silicon PV modules make the best use of limited space, install more quickly and reduce other material costs, resulting in lower total cost of ownership. Mitsubishi Electric is recognized worldwide for its commitment to excellence in engineering and manufacturing.

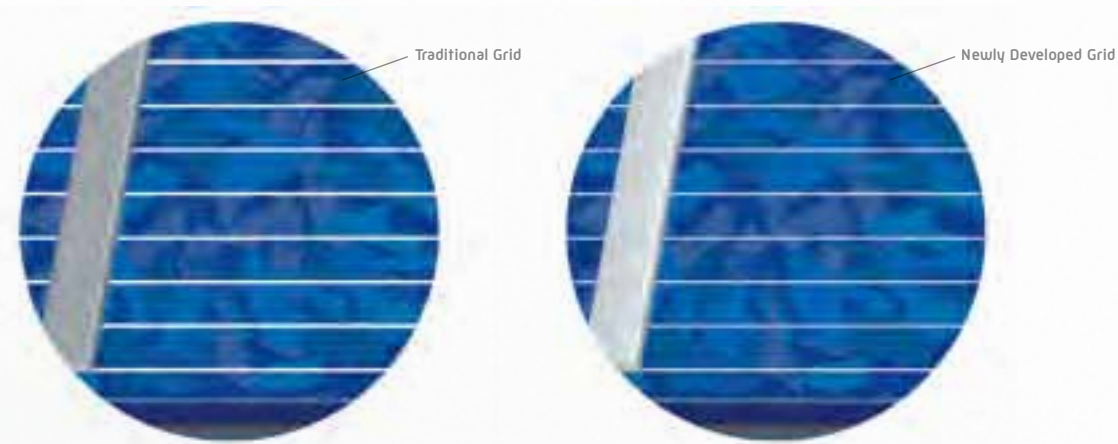
Solder-free Cells

Our newly developed silver electrode technology offers superior weatherproofing and has perfected a manufacturing process for solar cells that does not require solder coatings. By removing solder from our solar cells, we have eliminated the harmful lead ingredient commonly used in solder, decreasing radiation absorption. Our solder-free cells create a more uniform light reflection, leading to overall improvements in cell efficiency.



Fine Grid Electrodes

Fine grid electrodes improve module efficiency by increasing the amount of surface area available to absorb light.



Anti-reflective Coating

Anti-reflective coating on the glass prevents the sun's rays from reflecting off the module and allows more light energy to be absorbed by the cells. This additional light absorption leads to increased module efficiency.

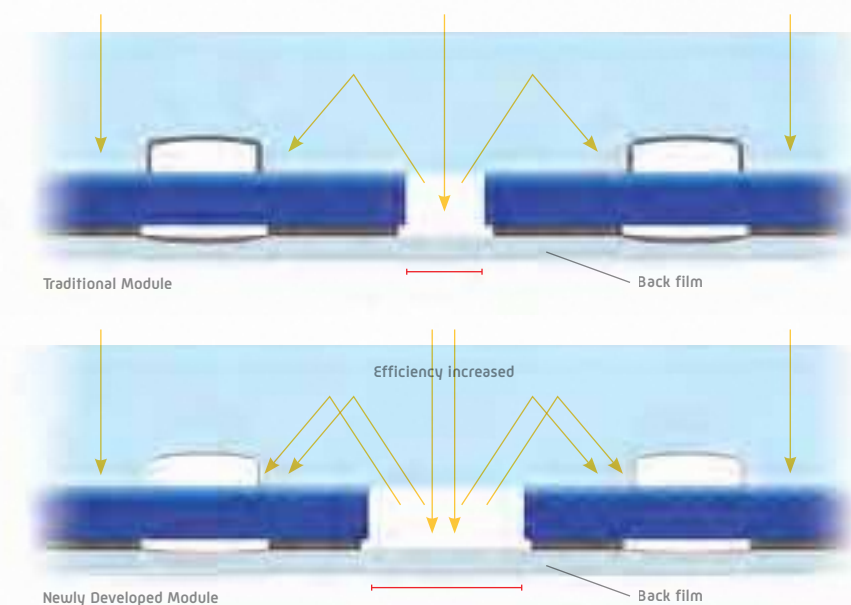
High Efficiency Modules

Unique Bus Bar Design

Our unique bus bar design dramatically improves module efficiency by reducing bus bar series resistance.

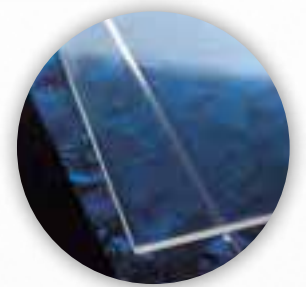
Back Film Reflected Light

By increasing the space between the cells and enhancing the characteristics of the back film, more reflected light is trapped in the module, leading to higher module efficiency.



Cerium-free/High-transmittance Glass

The use of Cerium-free, high-transmittance glass has reduced energy loss from light passing through the module's glass surface.



High Power Output in Real World Situations

Mitsubishi Electric conducts precise tests under controlled laboratory conditions to determine the optimal power output of our modules. Our factory shipment test values exceed the nominal output power for each carton (two modules per carton). These efforts combine to realize high power generation performance in actual use. In addition, our modules are subjected to the California Energy Commission's PV USA Test Conditions, using variables that determine how our modules will perform in real-world situations.

Tight Tolerance (UD5 series)

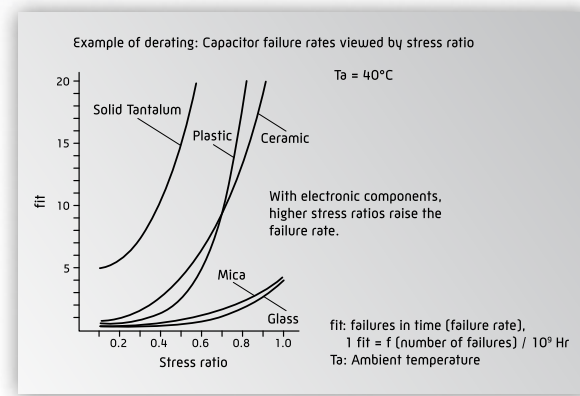
Our photovoltaic modules have one of the tightest power tolerances in the industry (+/- 3%) and the power output of our modules frequently exceeds expectations.

High Reliability

Our photovoltaic modules are engineered to withstand the harshest environmental conditions, including extreme heat, cold and humidity. Designed for optimal performance in real-world conditions, our PV modules are built to last.

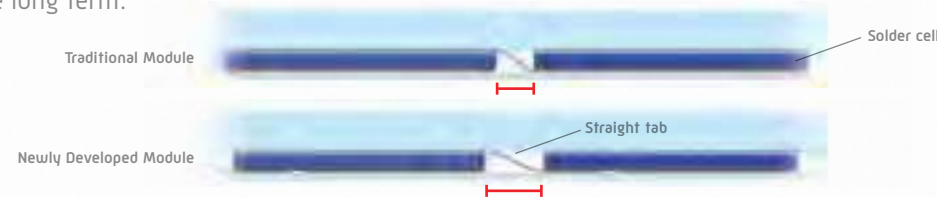
Original Component Derating Design

Our modules are designed to place lower electrical stress on each internal component. By derating each component, we lower the failure rates and increase longevity and reliability.



Straight Tabs

By increasing the space between each solar cell and using straight tabs to connect each cell in series, we have reduced the stress on the tab wiring, ensuring stellar dependability over the long term.



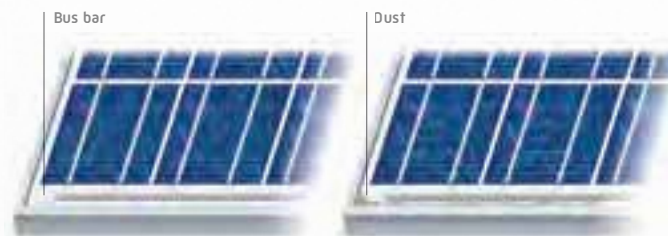
Double-sided Independent Tabs

Mitsubishi Electric has separated the tab wiring between the front and the back of the module. This improves the reliability of the connections and allows for thinner solar cells.



Reliable Bus Bar

Our modules are designed with ample distance between the bus bar and the module frame to prevent short circuits and insulation degradation. This innovation also helps prevent dust from accumulating in the frame area, reducing deration over time.



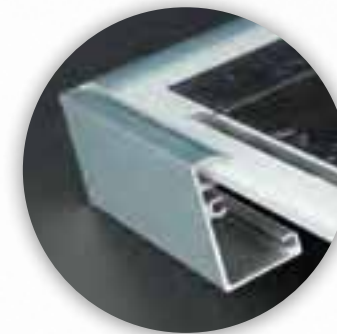
Corrosion-resistant Frame

Our solar modules feature anodized and clear-film coated frames, which ensure long-term corrosion resistance under the most extreme environmental conditions.



High Tensile Strength Structure

An advanced hot melt sealing agent is used at the laminate and frame connections. In addition, a long bottom flange has been engineered into the frame structure to reduce stresses on the laminate which increases the longevity of the module.



Solid Frame Structure

Our modules are designed with solar structural extrusion to maintain strength when bent or flexed. The protection bar on the back of the module increases the stability of the frame where snow, heavy winds, or other external loads exist.

Protection Bar (UD5 series)

The unique protection bar combined with our high-strength glass is used to maintain an IEC static load rating of 5,400 Pa (112 lbs per square foot), even in our largest photovoltaic modules. The protection bar also easily meets the drop test requirements of a 1.18 pound steel ball dropped from a height of 51 inches onto the front of the module.



Static Load Testing



Impact Testing



Three-layer Structure Back Film

The newly developed PET-type back film uses a triple layer construction. This added protection greatly increases weather resistance improving the reliability and longevity of the module.

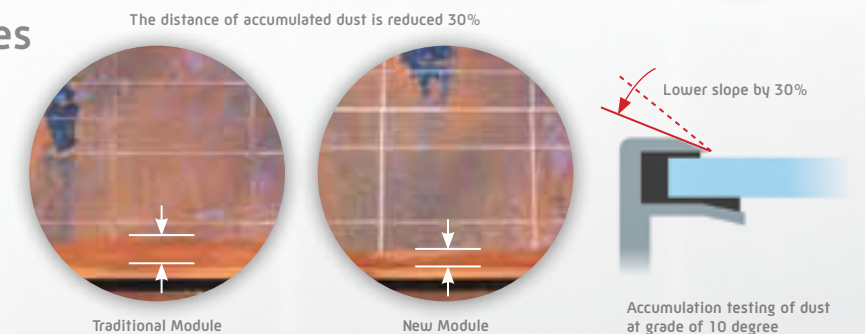
Water Drainage Structure

Our modules have two holes on the edge of the frame back to allow better water drainage. This reduces the potential for water damage and moss or dirt accumulation.



Lower Slope of Module Frames

Our module frames have been designed with a 30% lower slope than traditional modules. This increases power output in instances where modules are installed at a lower angle by preventing dust from accumulating in the frame area.

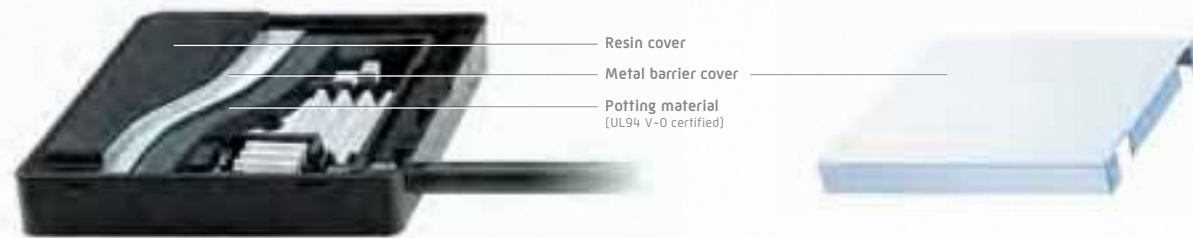


High Safety

Photovoltaic installations produce high voltages and when combined with harsh environmental conditions can result in dangerous malfunctions or even fire. At Mitsubishi Electric, each product is designed with safety as a top priority, increasing peace of mind for the life of the installation.

Triple-layer Structure Junction Box (patent pending)

The world's first triple-layer structure junction box with a metal cover to ensure complete protection from combustion, water and fire in the junction box.



Ultra Reliable Bypass Diode

The bypass diode has been built into the junction box, preventing shaded cell temperatures from rising and maximizing power output per module when module is partially shaded. The new diode complies with the IEC6125 second edition bypass diode thermal test.

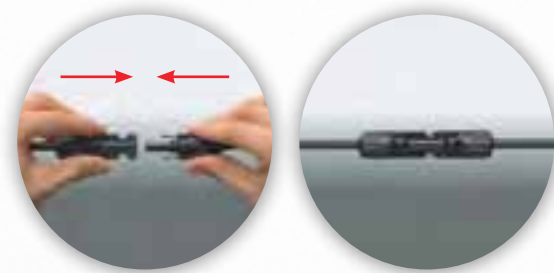


Connectors with Mechanical Locks

We use the highest quality mechanical locking connectors to improve electrical reliability, safety and weather resistance. Our locking connectors conform to US and European safety standards (UL1703, EN61730) and make the installation process faster and easier.



Conformity with U.S. and European safety standards (UL 1703, EN61730).



Lighter Weight (UD5 series)

The added protection bar on the back of the module allows for thinner glass to be used, which reduces the overall weight of the module. A lighter module makes transportation and installation easier.

Eco-Friendly

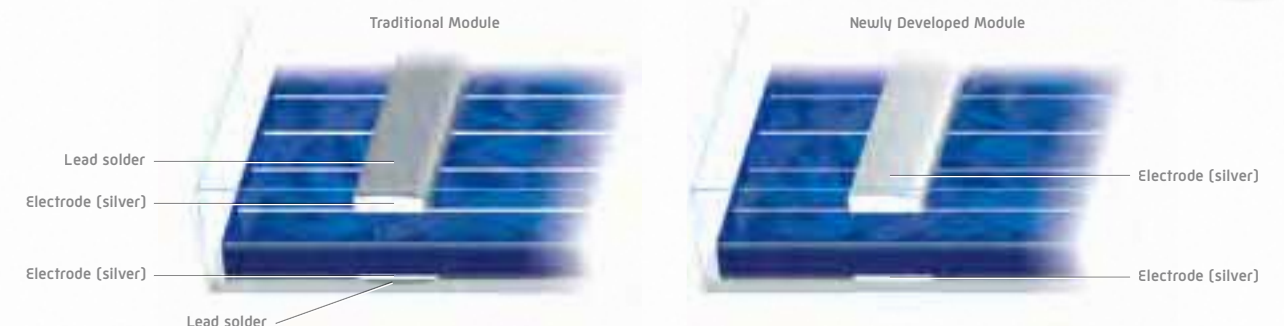
Mitsubishi Electric's commitment to protecting the environment is reflected in our photovoltaic modules. In addition to supporting green energy initiatives, our manufacturing and business practices are eco-friendly.

Eco-Products

Mitsubishi Electric is proud to use 100% lead-free solder in the production of our photovoltaic modules. While a typical residential installation (3kW system) using traditional modules contains approximately 864 grams of lead, the solder used in our cells has 0* grams.

*lead volume used in soldered parts, when using 24x40-cell type modules.

0g*



Eco-Factory

We have made a commitment to eco-friendly manufacturing processes and our manufacturing plants are certified under the stringent ISO 14001 environmental standards. In addition, our plants use water conservation techniques and recycling whenever possible.



Wastepaper Recycling Program

Eco-Logistics

By using recyclable steel pallets to ship our modules, we have significantly reduced the amount of wood we use during the shipping process while ensuring superior protection of the components while in transit.



100% Recyclable Steel Pallets

Our modules are packaged with recyclable cardboard and contain no polystyrene. By reducing the amount of cardboard used to package each module by 33% we have reduced waste while creating a box design that makes opening each module easy for installers.

Installation Examples

Renowned for stellar function and reliability, Mitsubishi Electric solar modules have been installed in a broad range of applications including commercial, residential, agricultural and industrial sites.

United States Installations



Residential
2kW



Retail
680kW



Industrial
150kW



Vineyard
124kW



Agricultural
1.2MW



Residential
6.12kW



Agricultural
1MW



Brewery
1.29MW



Commercial
126kW



Residential
4.08kW



Agricultural
1.2MW



Residential
4.42kW

International Installations

Mitsubishi Electric's photovoltaic modules have been installed all around the world.



AUSTRIA - Small Power Plant
400kW



ITALY - Hotel
50kW



THAILAND - Private Residence
3kW



JAPAN - Platform
200kW



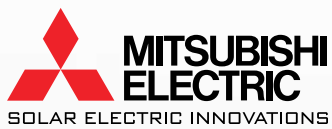
CHINA - Small Power Plant
30kW



INDIA - School
2kW



SWITZERLAND - School
23kW



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