Gokin Solar

Installation manual for

Photovoltaic Module

Contents

APPLICABLE PRODUCT LIST

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This installation manual does not make any warranty meaning, either express or implied. Gokin shall not be liable for any product damage, production, personal injury or property damage caused by any operation during the disposal, assembly/packaging, loading and unloading, handling, transportation, installation, commissioning, disassembly, operation and maintenance, etc.). Failure by the customer to comply with the requirements set forth in this manual in the installation of modules may result in the loss provided by the Customer. Gokin shall not be liable for any infringement of relevant rights or rights of third parties caused by the use of modules. At the same time, the suggestions in this manual are tested and verified by

Please ensure that you install or handle the integrity of the modules, do not use or install damaged modules, including but not limited to the surface (back) is not damaged, the backplane is not broken, the junction box lid is kept closed, the cables and connectors are not broken, and there is no bare metal.

Should photovoltaic modules suffer solely from diode failure (such as cold solder joints or thermal breakdown), the diodes may be replaced individually by qualified installation personnel.

All installation work must be in full compliance with local regulations and corresponding national or international electrical standards.

3.2 Electrical Safety

No matter whether the module is connected to the system or not, appropriate protective measures should be taken when touching the module or entering the [illegible], such as insulation tools, safety hats, insulation gloves, safety belts and insulation shoes, etc., to avoid direct contact with V or higher DC voltage, V or higher DC voltage is potentially fatal.

The module has no switch and can only be stopped by removing the module from light (for example, by shielding it with cloth, cardboard, or a completely opaque material).

In some cases, the open circuit voltage of the module or the short circuit current generated by the module exceeds the corresponding values tested under its standard test conditions (STC: irradiance W/m , module temperature C, atmospheric mass .). Therefore, the electrical design and calculation of the system need to be designed by a qualified electrical engineer, and reasonable coefficients should be multiplied when calculating the module rated voltage, rated current, safety fuse and control specifications connected to the PV output.

Under normal conditions, a photovoltaic module is likely to experience

Only use compatible connectors to connect modules or connect modules to other devices. Removing the connector will result in loss of product warranty.

3.3 Handling Safety

To ensure the safety of modules during transportation and storage, unpack modules after they arrive at the installation site.

When stacking modules, strictly comply with the upper limit on the number of layers printed on the packing case. Do not stack more than two layers of vertical packages on the short side, but allow stacking of vertical packages on the long side.

During the storage process, protect the package from damage, and store the module in a dry and ventilated environment to avoid direct sunlight and humidity. If the modules are stored in an uncontrolled environment, they shall not be stored for more than months and additional measures shall be taken to protect the modules from moisture or sunlight.

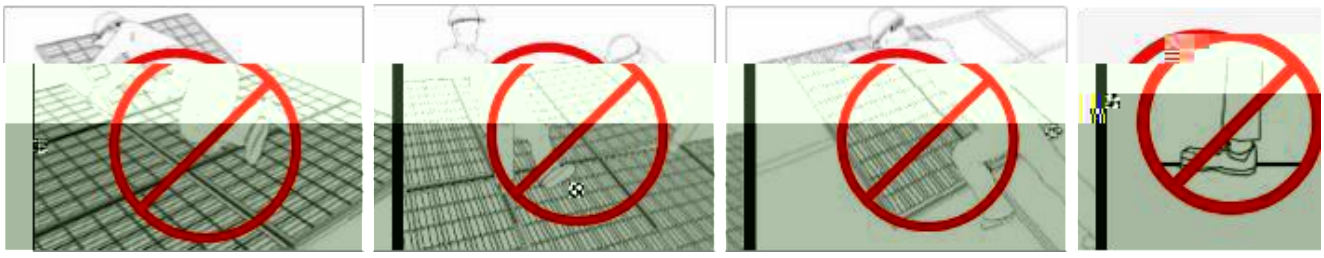
If the modules will not be installed within a short time after unpacking, the remaining modules should be placed horizontally on the tray in the form of border alignment, and the number of stacked pieces should not exceed . This temporary storage method does not allow secondary transfer; If a secondary transfer is required, place scattered modules of the same version together according to the number and placement of the whole package before unpacking, and secure the modules in the manner before unpacking with a packing tape (recommended pulling force: N). Finally, apply moisture-proof and dustproof measures before the secondary transfer.

When unpacking the modules, please follow the Gokin official packing and unpacking instructions.

Do not wear metal rings, watches, earrings, nose rings, lip rings or other metal materials when installing or repairing the photovoltaic system.

In any case, do not carry a module by lifting its wires and junction boxes. You can hold the frame of the module while carrying it.

Do not deform or bend modules due to factors other than their own weight during transportation or installation.



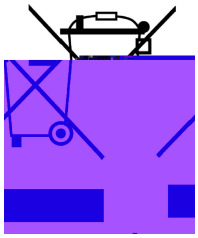
Do not stand, sit, trample, walk or jump on the assembly.

Do not apply excessive loads to modules or twist modules.

Disassemble or remove any part of the assembly, including but not limited to nameplates, labels, junction boxes, connectors, frames, etc.

Do not paint or apply any other adhesive to the surface of the module.

Drilling in the frame of the module is prohibited, which will result in a re



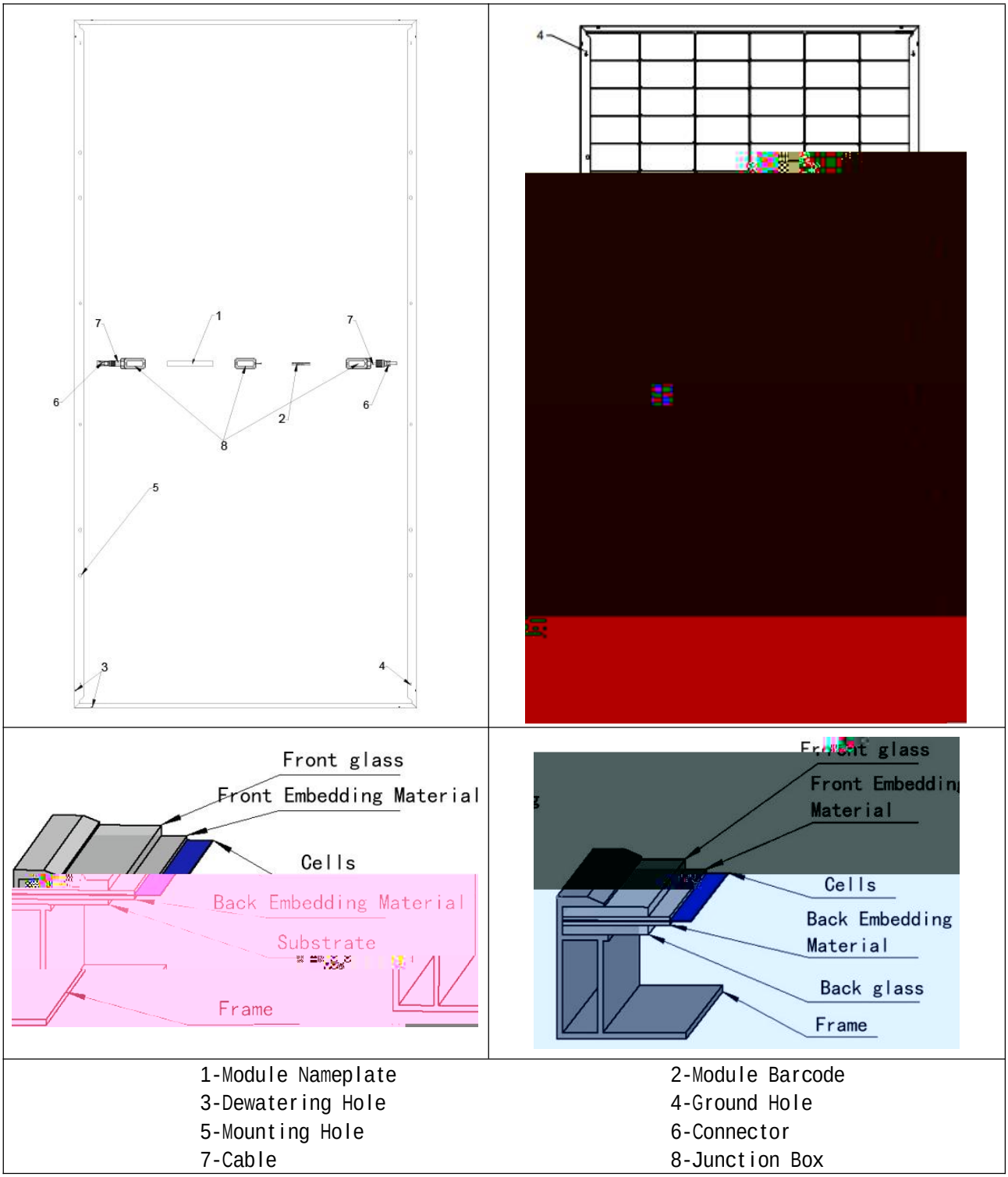
corrosive substances modules, affecting modules' safety or performance.

Please take protective measures to ensure reliable and safe installation of modules in severe environments such as heavy snow, cold and strong wind or islands close to water and salt mist or deserts.

the corrosion may still occur where the modules frame is connected to the bracket or where the grounding is connected. Gokin modules can be installed m away from the ocean side, and related parts and components should be protected with anti-corrosion measures.

4.2 Selection of Tilt Angles

Tilt angle of PV modules refer to the included angle between module surface and horizontal ground. The module le



1-Module Nameplate	2-Module Barcode
3-Dewatering Hole	4-Ground Hole
5-Mounting Hole	6-Connector
7-Cable	8-Junction Box

Three labels on the module contain the information below:

.Nameplate: Nameplate is placed on rear side of the module, which is printed with information such as product type, rated power, rated current, rated voltage, open circuit voltage, short circuit current under testing conditions, certification indicator, maximum system voltage, etc.

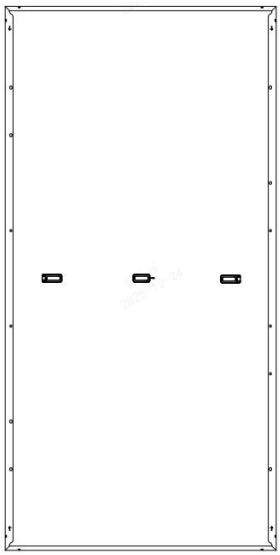
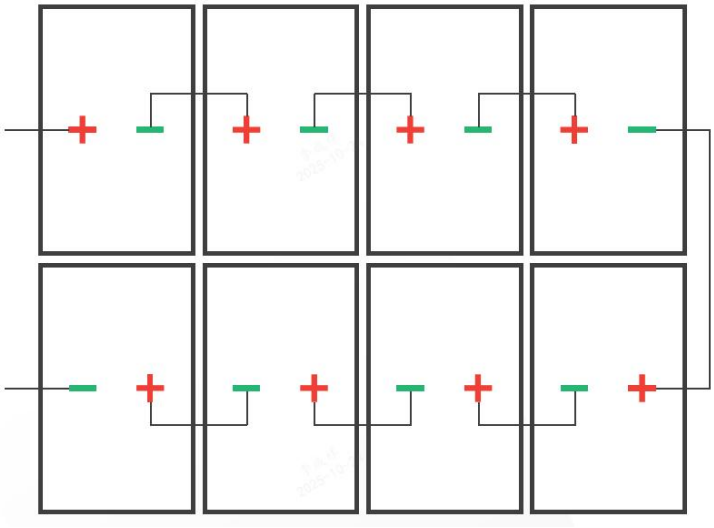
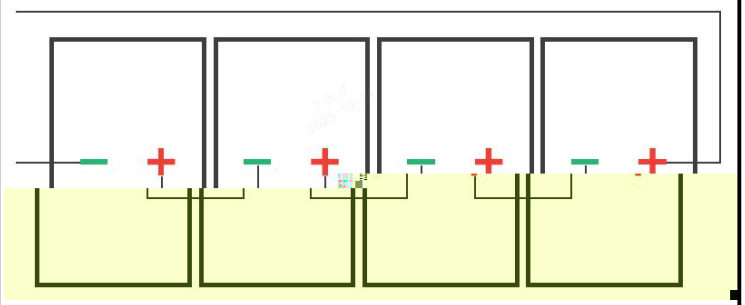
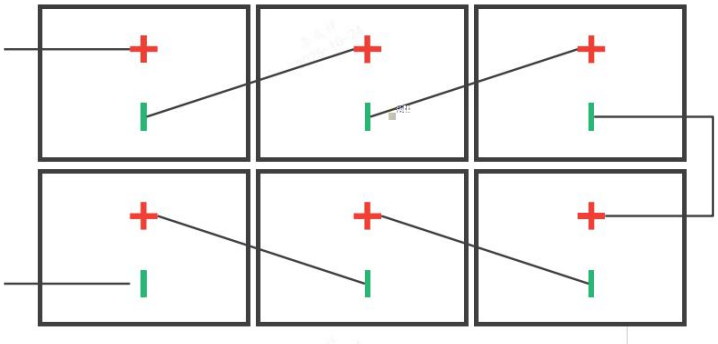
.Current classification label: Rated working current. (H indicates High, M indicates Medium, L indicates Low)

.Serial Number label: A unique serial number which is laminated inside the module permanently which can be found in the front of the module. There is another same serial number beside the module nameplate.

Note: Do not remove any labels. Removing any of these will void the Gokin warranty.

5.2 Wiring method

The Gokin component junction box is located in the middle. Refer to the table below for various component connection methods.

<table>
<tr><th>component junction box location</th><th>Component installation type</th><th>Wiring Diagram</th></tr>
<tr><td rowspan="3">  </td><td>Portrait installation:
Standard short cable length</td><td> 
C-type Wiring (Note: One end of the single row needs to be extended)</td></tr>
<tr><td>Portrait installation:
Standard short cable length</td><td> 
Linear Wiring (Note: One end of the single row needs to be extended)</td></tr>
<tr><td>Landscape installation:
Standard long cable length
or customized length</td><td>  </td></tr>
</table>

[redacted]

Note:

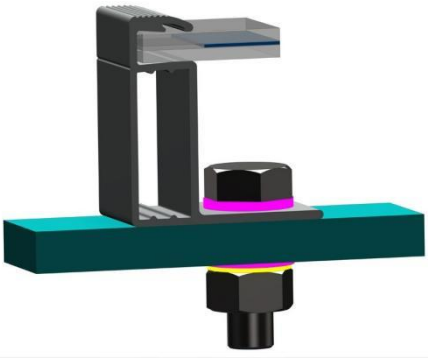
All installation methods mentioned herein are only for reference, and they are based on the test results from third-party tests and Gokin internal tests;

Gokin will not provide related mounting accessories, the specific installer or trained professional personnel must be responsible for the PV system's design, installation, and mechanical load calculation and system security.

Before installation, the following items shall be addressed:

a) Visually check the module for any damage. Clean the module if any dirt or residue remains;
b) Check if module serial number stickers match.

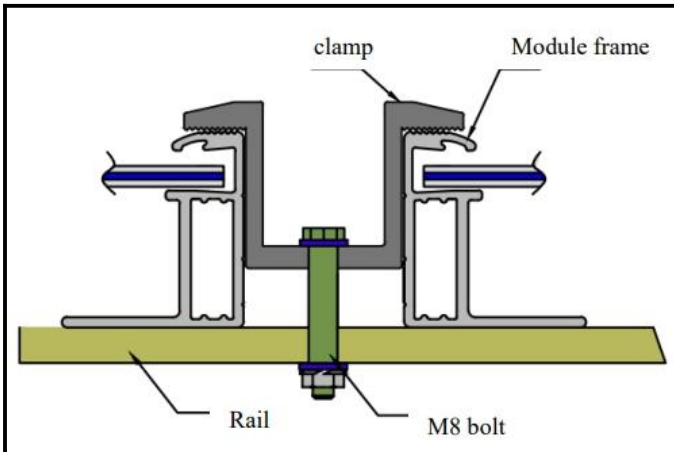
The maximum load that different types of modules can withstand on the front side and back side are dependent on installation methods, which can be referred to Table , Table and Table U. If there is heavy snow and strong

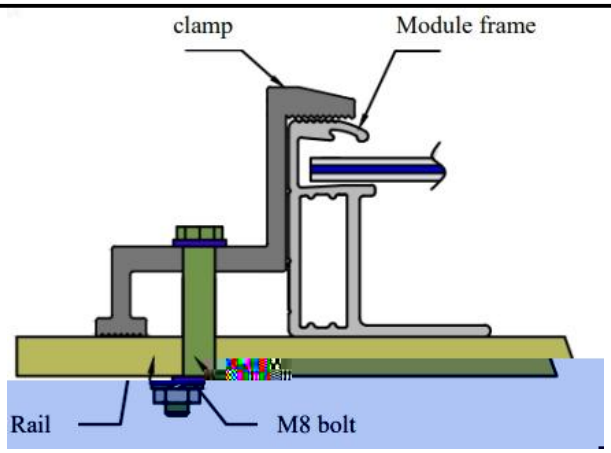


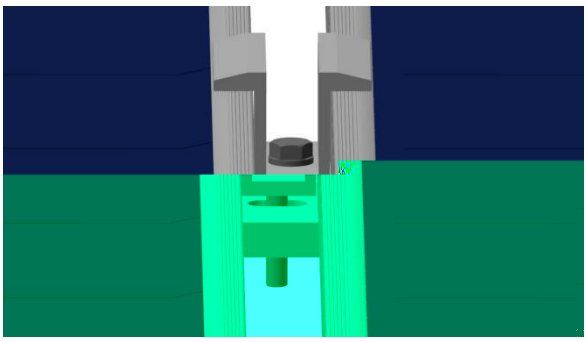
Mounting hole (mm)	Recommended bolt size
x	M
x	M

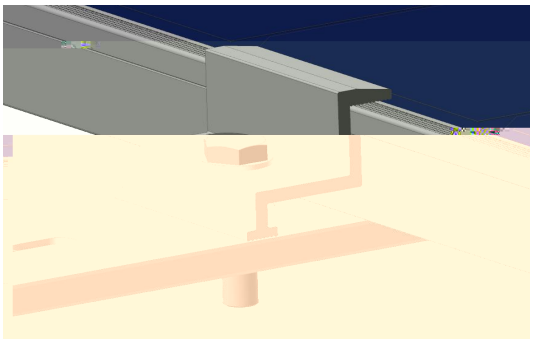
6.2 Fixed installation-mounting with clamps

The clamps must not be installed in contact with the front glass of the module and must not deform the module frame. Ensure that the clamps do not create a shadow on the module. Under no circumstances may the frame be altered. When choosing the mounting method for the clamps, make sure that there are at least four clamps on each module. The different mounting positions of the clamps determine the maximum load capacity of the module. Depending on the local wind and snow loads, if there is a possibility of excessive load combinations, additional clamps are required to ensure that the module has enough load carrying capacity. The torque value applied during installation of the clamps should be high enough to securely hold the module (consult installer or bracket supplier for exact torque value). Clamp dimensions and contact area must follow the values shown in Table .







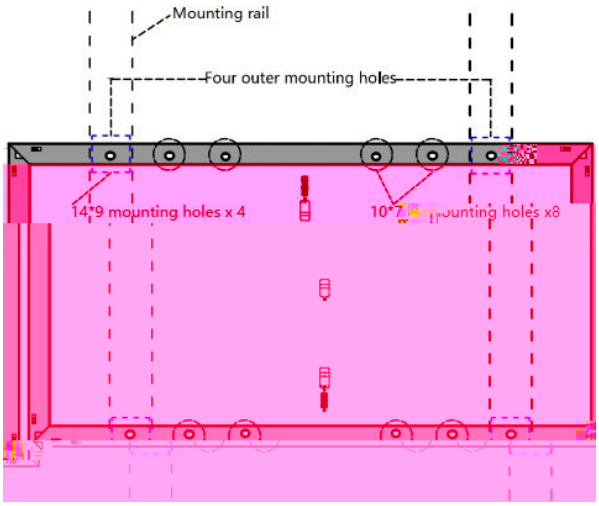


Middle modules installation

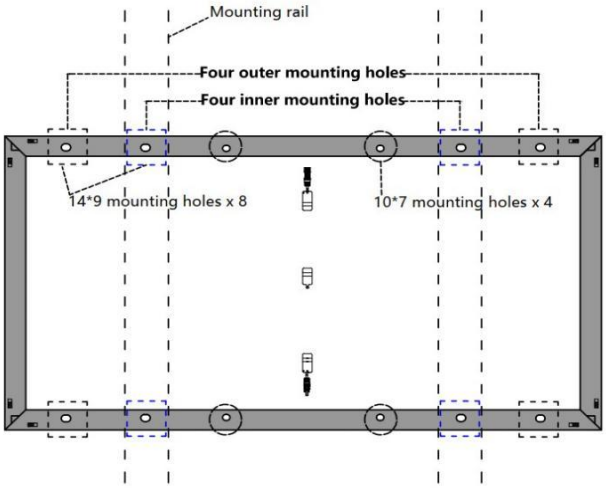
Fringe modules installation

6.3 Installation and Mechanical Load of Mono-facial Module

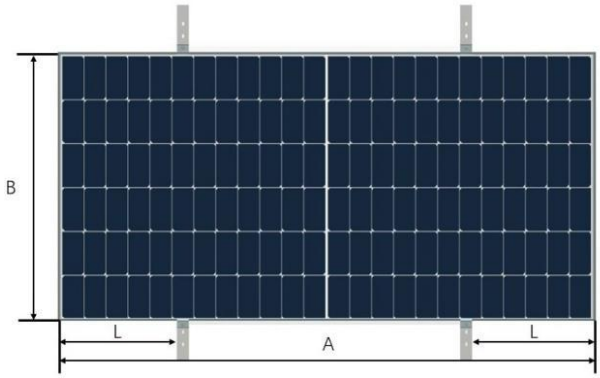
Mono-facial modules can be mounted by bolts or clamps. The mounting method and maximum test load are shown asfollow (The unit of distance and length in the table below is millimeter (mm), and the unit of



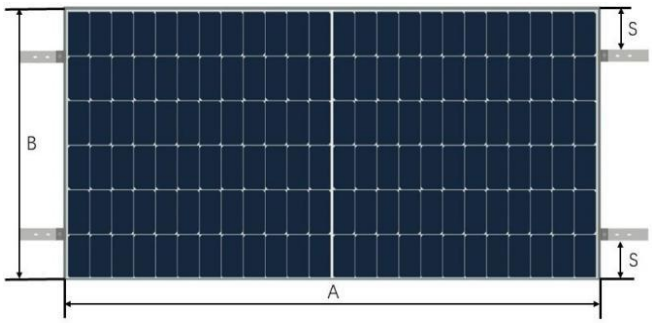
Outer four-hole bolts mounting
Mounting rails cross the long frame(Method)



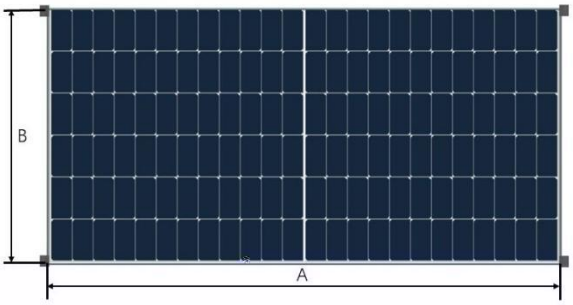
Inner four-hole bolts mounting
Mounting rails cross the long frame(Method)



Clamps mounting
Mounting rails cross the long frame(Method)



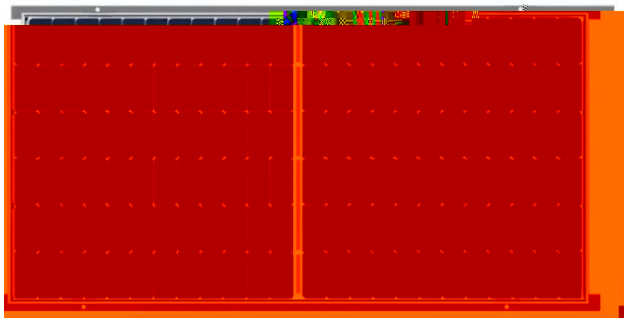
Clamps mounting
Mounting rails cross the short frame(Method)



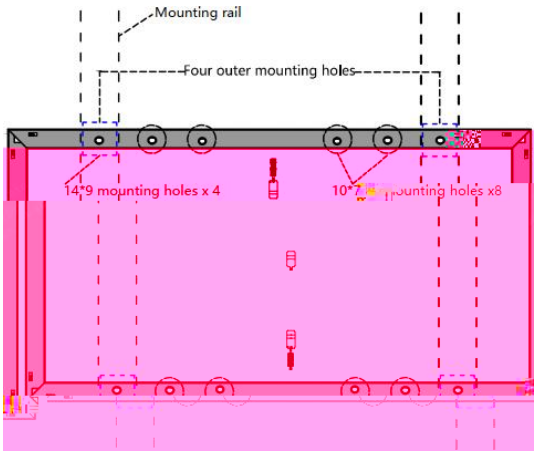
Clamps are mounted at the corners of short frame(Method)

6.3 Installation and Mechanical Load of Bifacial module

Bifacial modules can be mounted by bolts or clamps. The mounting method and maximum test load are shown as follow(The unit of distance and length in the table below is milimeter (mm), and the unit of pressure is Pascal (Pa)).

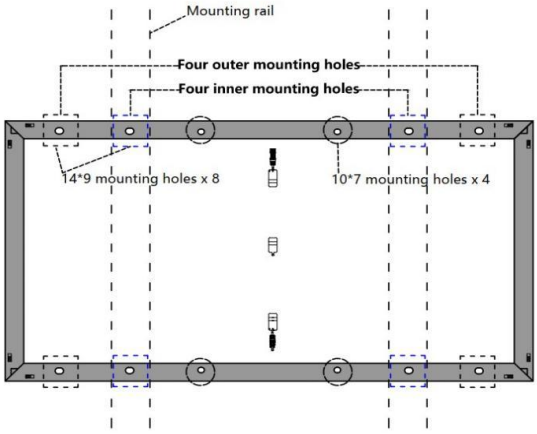


Outer Four-hole bolts Mounting
Mounting rails parallel the long frame(Method)

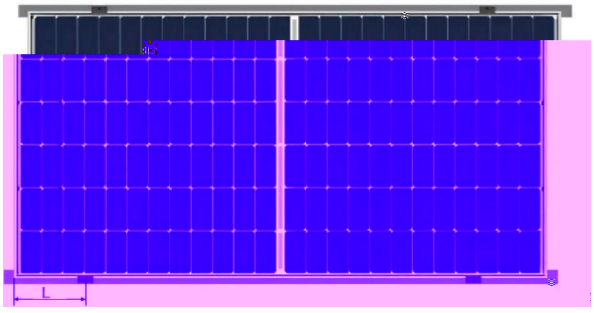


Outer four-hole bolts mounting
Mounting rails cross the long frame.(Method)

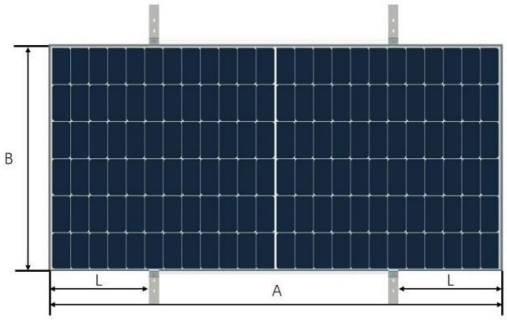
Inner Four-hole bolts Mounting
Mounting rails parallel the long frame(Method)



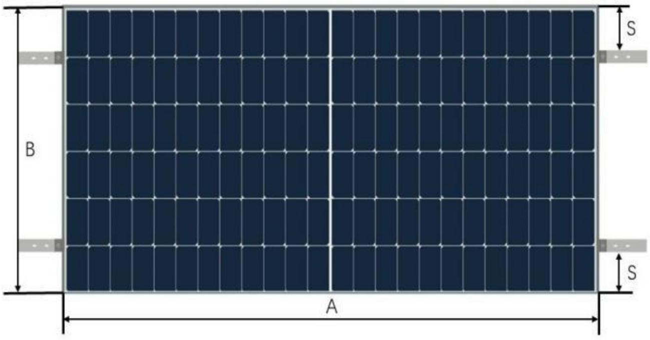
Inner four-hole bolts mounting
Mounting rails cross the long frame(Method)



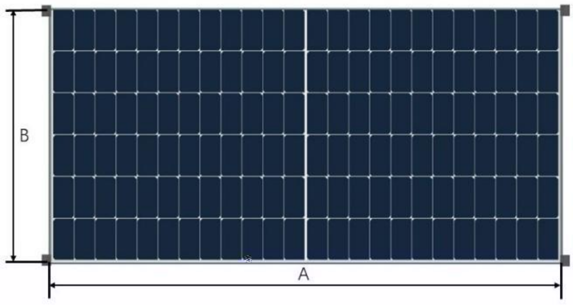
Clamps mounting
Mounting rails cross the long frame(Method)



Clamps Mounting
Mounting rails cross the long frame(Method)



Clamps mounting
Mounting rails cross the short frame(Method)



Clamps are mounted at the corners of short frame(Method

07 Grounding

To ensure safety and protect modules from lightning strikes and static electricity, ensure that the module frame is grounded.

Gokin recommends always referring to local and national codes and requirements for grounding photovoltaic modules. If local authorities allow it, Gokin strongly recommends using negative grounding.

The support grounding hardware and wiring must be installed to the appropriate grounding mark on the support to ensure proper electrical connections.

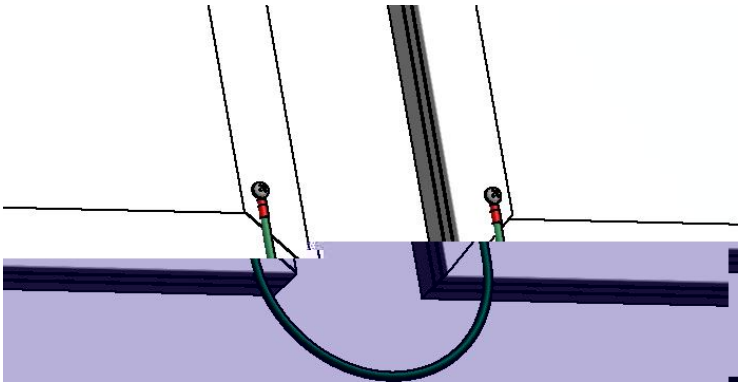
There is a ground hole with a diameter of Φ . mm at both ends of the back frame of the module. The ground hole on the frame is identified by the typical ground symbol (⏚) according to the IEC - standard. It can only be used for grounding, not for module installation.

The grounding connection should be performed by qualified electricians, and the grounding device must be made by a qualified electrical manufacturer. All conductive connection points with the PV module frame need to penetrate the insulation layer to ensure reliable grounding.

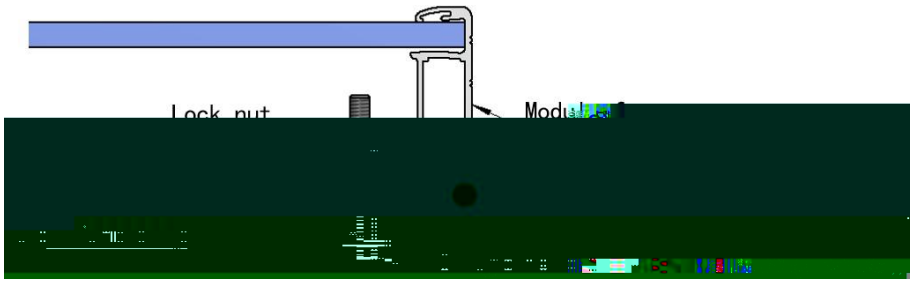
Do not add any additional ground holes to the assembly frame.

Gokin recommends grounding resistance Ω.

Use a mm copper core wire to ground modules. Place the star washer, flat washer, and ground cable one by one, thread a screw through the ground hole, and then tighten the screw to connect the adjacent ground holes on the module frame. The modules can also be grounded safely.



Gokin recommends the following grounding methods:



The nuts and washers are made of stainless steel. The material and size of the ground cable should meet the requirements of the local national, regional or international regulations, laws and standards. to mm²

(AWG -) exposed copper cable is recommended.

Gokin PV modules can be grounded using a third-party grounding device, but the grounding must be proven reliable.

08 Electrical Installation

8.1 Safety Instruction

All wiring installation should be carried out by qualified installers in accordance with local electrical construction codes, procedures, and regulations.

Modules can be connected in series to increase the operating voltage by connecting the positive terminal of one module into the negative terminal of the next one. Before connecting, always ensure that the contacts are corrosion-free, clean, and dry.

The product can be irreparably damaged if an array string is connected in reverse polarity to another. Always verify the voltage and polarity of each string before making a parallel connection. If a reversed polarity or a difference of more than V between strings was detected, check the string configuration before connection.

The standard copper cables applied in Gokin Solar modules are UV resistant and with a crosssectional area of mm² (AWG). All other cables applied to connect the DC system should be provided with a similar or larger wire cross section. Gokin Solar recommends that all cables are routed in appropriate conduits or rails where water does not accumulate.

The string voltage must not be higher than the maximum system voltage, as well as the maximum input voltage of the inverter and the other electrical devices installed in the system. In order to ensure this, the open circuit voltage of an array needs to be calculated at the lowest expected local ambient temperature, which can be determined using the following formula:

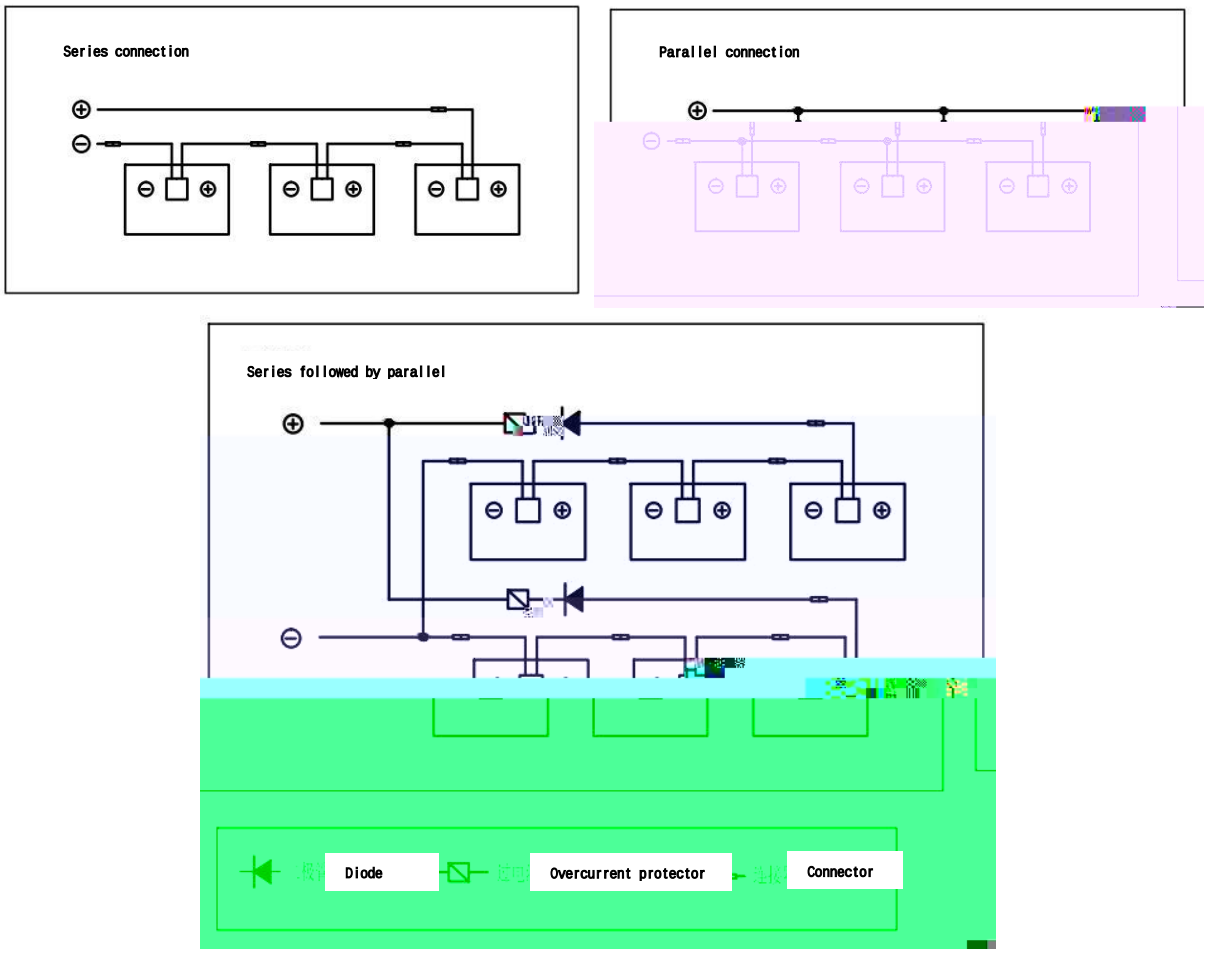
Max System Voltage N [( )]where

N Number of modules in series

Open circuit voltage (refer to product label or data sheet)

Temperature coefficient of open circuit voltage (refer to data sheet)

The minimum ambient temperature



If reverse current exceeding the component's maximum fuse current may flow through it, a current-limiting protection device of the same specification must be used to protect the component. For parallel strings of two or more, each string must have a current-limiting protection device, as shown in Figure .

8.2 WIRING

The number of modules that can be connected shall be determined by a qualified institution or person in accordance with the design specifications of the photovoltaic system and the local electrical design specifications. The calculation formula recommended by Gokin Solar shall be for reference only.

Every module is provided with two standard output cables, and each terminated with a plug-and-play connector. All wiring and electrical connections must be installed in accordance with the electrical design and construction specifications, procedures and regulations at the place of installation. The minimum and maximum outer diameters of the cable are to mm (. to . in).

For wiring connections, please use standard PV copper wires with a cross-section area of at least mm² (AWG), and should be light-resistant and temperature-resistant at a minimum of C.

Do not bend the cables less than mm (. inch) radius. PV cables will be damaged if bending radius less than mm.

In order to ensure the normal operation of the system, when connecting the module or loads (such as inverters, batteries, etc.), observe to ensure that the polarity of the cable is connected correctly. If modules are not connected correctly, the bypass diode could be damaged. PV modules can be connected in series to

increase the voltage and connected in parallel to increase the current.

Before connecting the module, please make sure using the connector approved by Gokin. Otherwise, Gokin does not responsible for any potential problem.

8.3 FUSING

The correction factor of a fuse shall be determined by an authorized professional electrical engineer in accordance with the relevant design regulations and system simulation results. Gokin Solar does not responsible for determining the minimum rating of fuse.

The fuse rated current should be chosen depending on different standards, as follows:

. ( )

. ( )

where

Fuse rated current [A]

Short circuit current of the module [A]

Temperature correction factor [-]

A correction factor ( ) should be applied for determining the fuse rated current working at different temperatures. Please confirm the final fuse selection with the qualified design institutes and fuse manufacturer. The maximum series fuse rating value on the products' datasheet provided by Gokin Solar should be used for reference only.

09 Maintenance

Please be sure to check and maintain the modules regularly, especially during the warranty period, which is the user's responsibility, and notify Gokin customer service within two weeks if the modules are found to be damaged or other significant anomalies.

9.1 Visual Inspection

Please carefully check the modules for appearance defects, focusing on the following points:

. Module glass cracks.

. Corrosion at welding parts of the cell main grid (caused by moisture into the module due to damage of sealing materials during installation or transportation).

. Check whether there are traces of burning mark on the module back sheet.

. Check PV modules if any signs of aging including rodent damage, climate aging, connectors tightness, corrosion and grounding condition.

. Check if any sharp objects in contact with PV modules' surface

. Check if any obstacles shading the PV modules

. Check if any loose or damage screws between the modules and mounting system. If so, adjust and fix in time.

9.2 Cleaning

The power generation of photovoltaic modules is related to the solar radiation received by their cells. Dirt blocking the glass surface of the module will reduce its power output and may even cause regional heat spots, so it is important to keep the surface of the module clean, usually need to clean the surface of the module dirt such as: bird droppings, leaves, ash layer, etc. Gokin recommends that modules be cleaned at least once a year, and modules installed in dusty environments or at low angles should be cleaned appropriately to ensure the cleanliness of the module surface. Uncontrolled contamination and failure to clean modules in a timely manner will void the warranty.

This section contains Gokin PV module cleaning requirements, system users and professional installers should carefully read and strictly follow. Failure to follow these instructions may result in personal injury or property damage. Gokin is not responsible for any damage caused by improper cleaning methods and will lose the limited warranty of the product.

Warning

Cleaning can cause damage to modules and a range of modules, as well as increasing the risk of electric shock.

Cracked or damaged modules pose a risk of electric shock due to leakage of current, and damp modules increase this risk. It is necessary to thoroughly inspect the modules for cracks, damage, and loose joints before cleaning.

During the day, the voltage and current present in the array is sufficient to cause a fatal electric shock accident, and the photovoltaic module should be cleaned under low irradiance conditions.

Before cleaning, make sure the circuit is disconnected.

Please wear suitable protective clothing (clothing, insulating gloves, insulating shoes, etc.) when cleaning.

Do not immerse the module in part or in whole in water or any kind of cleaning solution.

Generally, the back of the module does not need to be cleaned. If it is necessary to clean the back of the double-sided module, be careful to avoid damage to the back of the module. It is recommended to carefully clean the stain with your hand or sponge.

Please use the solvent specified by Gokin in the cleaning method.

Cleaning Method

. High pressure water cleaning

Water quality requirements: PH ~
Water hardness: calcium carbonate concentration mg/L (Soft water cleaning is recommended)
Water pressure: MPa(bar)

. Compressed air cleaning

Air pressure cleaning is recommended when cleaning soft stains (like dust) on modules.

. Wash by hand

If there are too many stains on the surface of the module, carefully use an insulating brush, sponge, or

other soft cleaning tool.

Make sure any brushes or agitating tools are made of insulating material to minimize the risk of electric

Appendix 1: Electrical parameter

MODULE TYPE/S	GK- -HT-M	G -	GK- -HT-M	- HT-M	GK HT-M	K- -HT-M	G -	- M	GK-	GK- -HT	GK- -HT-M
Voc-STC ( ) [V]	.	.		.	.	.	.		.		.
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( ) [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class

MODULE TYPE/S	GK- -HT-M	GK- -HT-M	GK- -HT-M
Voc-STC ( )) [V]	.	.	.
Isc-STC ( ) [A]	.	.	.
VPmax-STC [V]	.	.	.
IPmax-STC [A]	.	.	.
Pmax ( ) [W]			
Vsys [V]			
Maximum series fuse [A]			
Class of Protection	Class	Class	Class

. .]

fuse [A]											
Class of Protection	Class										

MODULE TYPE/S	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M				
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.	.	
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( ) [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	

MODULE TYPE/S	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( ) [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class		

MODULE TYPE/S	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M			
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.			
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.			
VPmax-STC [V]	.	.	.	.	.	.	.	.			
IPmax-STC [A]	.	.	.	.	.	.	.	.			
Pmax ( ) [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class			

MODULE TYPE/S	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M	GK- -HT-M			

Voc-STC ( ) [V]	.	.	.	.	.	.	.	.			
Isc-STC ( ) [A]	.	.	.	.		.	.	.			
VPmax-STC [V]	.	.	.	.	.	.	.	.			
IPmax-STC [A]	.	.	.	.	.	.	.	.			
Pmax ( ) [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class			

MODULE TYPE/S	GK- - ñðHT-M	GK- - HT-M	GK- - HT-M	GK- - HT-M	GK- - HT-M	GK- - HT-M
Voc-STC ( ) [V]	.	.	.	.	.	.
Isc-STC ( ) [A]	.	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.	.
Pmax ( ) [W]						
Vsys [V]						
Maximum series fuse [A]						
Class of Protection	Class	Class	Class	Class	Class	

VPmax-STC [V]	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.		
Pmax ( ) [W]							
Vsys [V]							
Maximum series fuse [A]							
Class of Protection	Class	Class	Class	Class	Class		

MODULE TYPE/S	GK- - HP- M	GK- - HP- M

fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	

MODULE TYPE/S	GK- -HG-M/ GK- -HGb-M	GK- -HG-M/ GK- -HGb-

MODULE TYPE/S	
Voc-STC (Ғvyþ[V]	Ð7
Isc-STC ( ) [A]	
VPmax-STC [V]	
IPmax-STC [A]	
Pmax ( ) [W]	
Vsys [	ñì

fuse [A]
Class of
Protection

IPmax-BNPI [A]	.	.	.								
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.								
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class								
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.	.	.
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.	.	.
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M
Voc-STC ( ) [V]	.
Isc-STC ( ) [A]	.
VPmax-STC [V]	.
IPmax-STC [A]	.
Pmax ( )-STC [W]	
Voc-BNPI ( ) [V]	.
Isc-BNPI ( ) [A]	.
VPmax-BNPI [V]	.
IPmax-BNPI [A]	.
Pmax ( )-BNPI [W]	
Isc-BSI ( ) [A]	.
Pmax ( )-BSI [W]	
Vsys [V]	
Maximum series fuse [A]	
Class of Protection	Class

Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M				
Voc-STC ( ) [V]	.	.	.	.	.	.	.				
Isc-STC ( ) [A]	.	.	.	.	.	.	.				
VPmax-STC [V]	.	.	.	.	.	.	.				
IPmax-STC [A]	.	.	.	.	.	.	.				
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.				
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.				
VPmax-BNPI [V]	.	.	.	.	.	.	.				
IPmax-BNPI [A]	.	.	.	.	.	.	.				
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.				
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M				
Voc-STC ( ) [V]	.	.	.	.	.	.	.				
Isc-STC ( ) [A]	.	.	.	.	.	.	.				
VPmax-STC [V]	.	.	.	.	.	.	.				
IPmax-STC [A]	.	.	.	.	.	.	.				
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.				
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.				
VPmax-BNPI [V]	.	.	.	.	.	.	.				
IPmax-BNPI [A]	.	.	.	.	.	.	.				
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.				
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.	.	.

Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.	.	.
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M				
Voc-STC ( ) [V]	.	.	.	.	.	.	.				
Isc-STC ( ) [A]	.	.	.	.	.	.	.				
VPmax-STC [V]		.	.	.	.	.	.				
IPmax-STC [A]	.	.	.	.	.	.	.				
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.				
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.				
VPmax-BNPI [V]	.	.	.	.	.	.	.				
IPmax-BNPI [A]	.	.	.	.	.	.	.				
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.				
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.		

VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.		
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class		
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.	.	.
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.	.	.
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.	.	.
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	.
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	GK- -HTBD-M	
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.	.	
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.	.	
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BSI [W]											
Vsys [V]											

Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.		
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class		
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M			
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.			
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.			
VPmax-STC [V]	.	.	.	.	.	.	.	.			
IPmax-STC [A]	.	.	.	.	.	.	.	.			
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.			
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.			
VPmax-BNPI [V]	.	.	.	.	.	.	.	.			
IPmax-BNPI [A]	.	.	.	.	.	.	.	.			
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.			
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class			
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M	GK- - HTBD - M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.		
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
tion	Class	Class	Class	Class	Class	Class	Class	Class	Class		
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M
V]	.	.	.	.	.
Isc-STC ( ) [A]	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.
Pmax ( )-STC [W]					
Voc-BNPI ( ) [V]	.	.	.	.	.
Isc-BNPI ( ) [A]	.	.	.	.	.
VPmax-BNPI [V]	.	.	.	.	.
IPmax-BNPI [A]	.	.	.	.	.
Pmax ( )-BNPI [W]					
Isc-BSI ( ) [A]	.	.	.	.	.
Pmax ( )-BSI [W]					

[W]											
Voc-BNPI ( ) [V]	.	.	.	.	.						
Isc-BNPI ( ) [A]	.	.	.	.	.						
VPmax-BNPI [V]	.	.	.	.	.						
IPmax-BNPI [A]	.	.	.	.	.						
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.						
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class						
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M						
Voc-STC ( ) [V]	.	.	.	.	.						
Isc-STC ( ) [A]	.	.	.	.	.						
VPmax-STC [V]	.	.	.	.	.						
IPmax-STC [A]	.	.	.	.	.						
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.						
Isc-BNPI ( ) [A]	.	.	.	.	.						
VPmax-BNPI [V]	.	.	.	.	.						
IPmax-BNPI [A]	.	.	.	.	.						
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.						
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class						
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M							
Voc-STC ( ) [V]	.	.	.	.							
Isc-STC ( ) [A]	.	.	.	.							
VPmax-STC [V]	.	.	.	.							
IPmax-STC [A]	.	.	.	.							
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.							
Isc-BNPI ( ) [A]	.	.	.	.							
VPmax-BNPI [V]	.	.	.	.							
IPmax-BNPI [A]	.	.	.	.							
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.							

Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class							
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M	GK- - HPBD - M							
Voc-STC ( ) [V]	.	.	.	.							
Isc-STC ( ) [A]	.	.	.	.							
VPmax-STC [V]	.	.	.	.							
IPmax-STC [A]	.	.	.	.							
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.							
Isc-BNPI ( ) [A]	.	.	.	.							
VPmax-BNPI [V]	.	.	.	.							
IPmax-BNPI [A]	.	.	.	.							
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.							
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class							
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M			
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.			
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.			
VPmax-STC [V]	.	.	.	.	.	.	.	.			
IPmax-STC [A]	.	.	.	.	.	.	.	.			
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.			
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.			
VPmax-BNPI [V]	.	.	.	.	.	.	.	.			
IPmax-BNPI [A]	.	.	.	.	.	.	.	.			
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.			
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class			
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

- M

MODULE TYPE/S	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	GK- - HGBD - M	
Voc-STC ( ) [V]	.	.	. -	.	.	.	.	.	.	.	
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.		.	.	.	.	.	
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-BNPI [V]	.	.	.	.		.	.	.	.	.	
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M	GK- - HGBD- M				
Voc-STC ( ) [V]	.	.	.	.	.	.	.				
Isc-STC ( ) [A]	.	.	.	.	.	.	.				
VPmax-STC [V]	.	.	.	.	.	.	.				
IPmax-STC [A]	.	.	.	.	.	.	.				
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.				
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.				
VPmax-BNPI [V]	.	.	.	.	.	.	.				
IPmax-BNPI [A]	.	.	.	.	.	.	.				
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.				
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class b	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGBD- M /GK- - HGD b-	GK- - HGBD- M /GK- - HGD M	GK- - HGBD- M /GK- - HGD M	GK- - HG

I-V Max B

IPmax-STC [A]	.	.	.	.	.	.	.				
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.				
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.				
VPmax-BNPI [V]	.	.	.	.	.	.	.				
IPmax-BNPI [A]	.	.	.	.	.	.	.				
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.				
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M
Voc-STC ( ) [V]	.	.	.	.	.	.	.
Isc-STC ( ) [A]	.	.	.	.	.	.	.
VPmax-STC [V]	.	.	.	.	.	.	.
IPmax-STC [A]	.	.	.	.	.		

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[W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.	.	
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	GK- - HGB D- M /GK- - HGD b- M	
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.	.	
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-STC [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-STC [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.		.	.	.	.	.	.	
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.	.	
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.	.	
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M	GK- - HGFB D- M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.		
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BNPI											

[W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M	GK- - HGF Db- M/ GK- - HGFB D- M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.		
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BSI [W]											
Vsys [V]											
Maximum series fuse [A]											
Class of Protection	Class	Class	Class	Class	Class	Class	Class				
Bifaciality coefficient	ϕPmax ,ϕIsc ,Voc										

MODULE TYPE/S	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M	GK- - HGB D- M		
Voc-STC ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-STC ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-STC [V]	.	.	.	.	.	.	.	.	.		
IPmax-STC [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-STC [W]											
Voc-BNPI ( ) [V]	.	.	.	.	.	.	.	.	.		
Isc-BNPI ( ) [A]	.	.	.	.	.	.	.	.	.		
VPmax-BNPI [V]	.	.	.	.	.	.	.	.	.		
IPmax-BNPI [A]	.	.	.	.	.	.	.	.	.		
Pmax ( )-BNPI [W]											
Isc-BSI ( ) [A]	.	.	.	.	.	.	.	.	.		

Pmax ( )-BSI
[W]
Vsys [V]

Appendix 2:J-BOX and connectors

J-box		Connector		cable		Bypass diode	
Manufacture	Type	Manufacture	Type	Manufacture	Type	Type	Technical data
Ningbo Minghe New Energy Technology Co.,Ltd	MH z	Ningbo Minghe New Energy Technology Co.,Ltd	PV-MH	Wuxi Xinhongye Wire&Cable Co., Ltd.	IEC * mm	SQ	Max. diode current [A]: Tj [C]:
		Stäubli Electrical connectors AG	PV-KST - EVO /xy_UR&PV-KBT - EVO /xy_UR.	Ningbo Kibor Wire&CableCo., Ltd	IEC * mm	SQ	Max. diode current [A]: Tj [C]:
				Xinya Electronic Co., Ltd	IEC * mm	SQ -SL (z)	Max. diode current [A]: Tj [C]:
						SQ (z)	Max. diode current [A]: Tj [C]:
QC Solar(Suzhou)Corporation	Type: Qxy	QC Solar(Suzhou)Corporation	QC . -cds	QC Solar (Suzhou) Corporation	H Z Z -K, * mm	QCM	Max. diode current [A]: Tj [C]:
		QC Solar(Suzhou)Corporation	QC . -ab	QC Solar (Suzhou) Corporation	IEC x . mm	QCM	Max. diode current [A]: Tj [C]:
		QC Solar(Suzhou)Corporation	QC			QCM	Max. diode current [A]: Tj [C]:
		Changshu Tlian Co.,Ltd.	T -PPE- T -PC-			QCM	Max. diode current [A]: Tj [C]:
		Tyco Electronics Austria GmbH.	PV -Syx&PV -Slyx			QCM B	Max. diode current [A]: Tj [C]:
		Stäubli Electrical connectors AG	PV-KST -EVO /xy&PV-KBT - EVO /xy				
		Stäubli Electrical connectors AG	PV-KST - EVO A/xy&PV-KBT - EVO A/xy				
Jiangxi Jinko PV Material Co., Ltd.	PV-JK Exy	Jiangxi Jinko PV Material Co., Ltd.	PV-JK M/xy	RUIXU INDUSTRY CO., Ltd.	IEC x . mm	TPA U-	Max. diode current [A]: Tj [C]:
		Jiangxi Jinko PV Material Co., Ltd.	PV-JK M /xyz	RUIXU INDUSTRY CO., Ltd.	H Z Z -K x . mm	TPA U-	Max. diode current [A]: Tj [C]:
		Jiangxi Jinko PV Material Co., Ltd.	PV-JK M /xy	SUZHOU YONGHAO CABLE CO., LTD.	IEC x . mm	TPA U-	Max. diode current [A]: Tj [C]:
		Stäubli Electrical connectors AG	PV-KST - EVO /xy_UR&PV-KBT -	SUZHOU YONGHAO CABLE CO., LTD.	H Z Z -K x . mm	TPA U	Max. diode current [A]: Tj [C]:
		Stäubli Electrical connectors AG	PV-KST - EVO A/xy&PV-KBT - EVO A/xy	Jiangxi Jinko PV Material Co., Ltd.	H Z Z -K x . mm		

				Jiangxi Jinko PV Material Co., Ltd.	IEC X , ... mm HALOGEN FREE LOW SMOKE			
				Jiangxi Jinko PV Material Co., Ltd.	IEC x , mm			
		Suzhou Xtong Photovoltaic Technologies Co.,Ltd	PV-XT . ;PV-XT . ;XT	Wuxi Xinhongye Wire & Cable Co., Ltd.	IEC X , ... mm	XT A (x , y , z)	Max. diode current [A]: Tj [C]:	
		Stäubli Electrical connectors AG	PV-KST -EVO /xy_UR&PV-KBT -EVO /xy_UR PV-KST -EVO A/xy&PV-KBT -EVO A/xy	Suzhou Xtong Photovoltaic Technologies Co., Ltd	IEC X , ... mm HALOGEN FREE LOW SMOKE	XT M-B (x or , y , z)	Max. diode current [A]: Tj [C]:	
Suzhou Xtong Photovoltaic Technologies Co.,Ltd	PV-XT Nxyz					XT M-A (x or , y , z)	Max. diode current [A]: Tj [C]:	
						XT (x	M-B, TM or	