

Maxeon

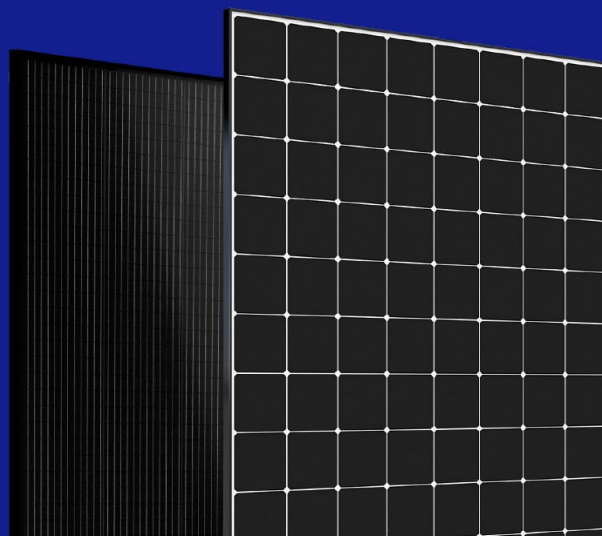
Solar Panels

Safety and Installation Instructions

United States

Maxeon and Performance

Photovoltaic panels



Safety and Installation Instructions

544753 Revision E

Published December 2023

This document applies to X-Series, MAX3 and MAX6 modules listed below:

- SPR-XYX-XXX-BLK
- SPR-XYX-XXX-COM
- SPR-MAX3-XXX
- SPR-MAX3-XXX-BLK
- SPR-MAX3-XXX-COM
- SPR-MAX3-XXX-R
- SPR-MAX3-XXX-BLK-R
- SPR-MAX6-XXX
- SPR-MAX6-XXX-COM

These modules do not have grounding restrictions and all are compatible with high-efficiency transformer less inverters.

This document describes the limited warranty, mounting configuration, handling, maintenance and cleaning of modules. Save this documentation for future reference and comply with all provided instructions.



For the latest revision please refer to

www.maxeon.com/us/InstallGuideUL

Contents of this manual are subject to change without notice.

Maxeon Solar Technologies, Ltd.

www.maxeon.com

maxeon

POWERING POSITIVE CHANGE

Safety and Installation Instructions (United States)

1.0 Introduction

These instructions provide safety and installation instructions for UL Listed Maxeon photovoltaic (PV) modules that have the UL logo on the product label:



IMPORTANT! Please read these instructions in their entirety before installing, wiring, or using this product in any way. Failure to comply with these instructions will invalidate the Maxeon Limited Warranty for PV Modules.

1.1 Disclaimer of Liability

The installation techniques, handling, and use of this product are beyond company control. Therefore, Maxeon assumes no responsibility for loss, damage or expense resulting from improper installation, handling, or use.

1.2 Underwriters Laboratories (UL) Listing Information

This product meets or exceeds the requirements set forth by UL 61730 and UL 61215. These Standards cover flat-plate PV modules and panels intended for installation on buildings or those intended to be freestanding. To satisfy the Listing for this product the modules must be mounted with a rack or standoff structure. The Listing does not include integration into a building surface because additional requirements may apply. This product is not intended for use where artificially concentrated sunlight is applied to the module.

1.3 Limited Warranty

Module limited warranties are described in full in the Maxeon warranty certificates obtainable at www.maxeon.com/us. In summary, the Limited Warranties do not apply to any of the following:

PV Modules subjected to: (i) misuse, abuse, neglect or accident; (ii) alteration or improper installation (improper installation includes, without limitation, installation that does not comply with all Maxeon installation instructions and operations and maintenance instructions of any type, as may be amended and updated from time to time at Maxeon's sole discretion, and all national, state, and local laws, codes, ordinances, and regulations); (iii) repair or modification by someone other than an approved service technician of Maxeon; (iv) conditions exceeding the voltage, wind, snow load, and any other operational specifications; (v) power failure or surges; (vi) indirect or direct damage from lightning, flood, fire or other acts of nature; (vii) damage from persons, biological activity, or industrial chemical exposure; or (viii) damage from impact or other events outside Maxeon's control.

1.4 Product Serial Identification

Serial Number Rule:
WXXYZZZZZZ

Where:

W – represents year of manufacture

XX – represents the week of manufacture

Y – represents the Factory location

ZZZZZZ – unique identification number assigned to each module.

2.0 Safety Precautions

Before installing this product, read all safety instructions in this document.

DANGER! Module interconnection cables pass direct current (dc) and are sources of voltage when the module is under load and when it is exposed to light. ***Direct current can arc across gaps and may cause injury or death if improper connection or disconnection is made; or if contact is made with module leads that are frayed or torn.*** Do not connect or disconnect modules when a current source is energizing the conductors. Modules may contain high voltage when interconnected with other modules.

- All installations must be performed in compliance with the National Electrical Code (NEC) and any applicable local codes.
- Modules certified to UL 61730 are Safety Class 2 for protection against electric shock
- There are no user-serviceable parts within the module. Do not attempt to repair any part of the module.
- Installation should be performed only by qualified personnel.
- Do not stand on, drop, scratch, or allow objects to fall on modules as doing so may damage them and void the warranty.
- Do not place anything on the modules, even for a moment because resulting residue may damage or stain the glass surface.
- If the front glass is broken, or the backsheet is torn, contact with any module surface or module frame can cause electric shock. Damaged modules should be immediately disconnected from the electric system. The module should be removed from array as soon as possible and contact the supplier for disposal instructions.
- Broken J-boxes or connectors are electrical hazards as well as laceration hazards. Installers should remove any such module from the array and contact Maxeon for disposal instructions.
- Do not install or handle the modules when they are wet or during periods of high wind.
- Do not block drain holes or allow water to pool in or near module frames.
- Maxeon recommends a conservative minimum cable bend radius of equal to or greater than 40 mm (1.5").
- Unconnected connectors must always be protected from pollution (e.g dust, humidity, foreign particles, etc), prior to installation. Do not leave unconnected (unprotected) connectors exposed to the environment. A clean assembly environment is therefore essential to avoid performance degradation.
- Do not allow the connectors to come in contact with chemicals such as sunscreen, greases, oils and organic solvents which may cause stress cracking.
- Do not disconnect any modules when its inverter is feeding in to the grid. Switch off the inverter before disconnecting, reinstalling or making any action with the modules.
- For connectors, which are accessible to untrained people, it is imperative to use the locking connectors and safety clips, if applicable, in order to defend against untrained personnel disconnecting the modules once they have been installed.
- Cover all modules in the PV array with an opaque cloth or material before making or breaking electrical connections.
- As the modules bend under the load, do not mount sharp objects (e.g. screws) near the module backside.
- Do not mount rails under the junction boxes
- Do not attach or adhere items at the backsheet of the modules.
- Contact Maxeon if maintenance is necessary.
- Save these instructions!

2.1 Fire Rating

The module fire rating is Type 2 per UL1703, 2013 edition. Fire rating classification for any PV system using UL1703:2013 can only establish a fire rating in combination with the mounting system ratings normally found in the mounting system installation instructions.

3.0 Electrical Characteristics

Electrical characteristics of the modules are described in Table 1 below. Rated electrical characteristics are within 10 percent of measured values at Standard Test Conditions of: 1000 W/m², 25°C cell temperature and solar spectral irradiance per IEC 60904-3 or irradiation of (air mass) AM 1.5 global (G) spectrum. Each module contains three bypass diodes. The maximum series fuse rating is 15A(X-Series), for MAX3 and MAX6 modules it is 20A. Under normal conditions, a photovoltaic module may experience conditions that produce more current and/or voltage than reported at Standard Test Conditions. Accordingly, the values of ISC and VOC marked on UL Listed modules should always be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes and size of controls connected to the module output. Refer to Section 690-8 of the NEC for an additional 1.25 Safety factor which may be applicable.

Table 1: Electrical Characteristics¹

Module	Rated Power (W) +5/-0%	Voltage at Rated Power Vmpp (V)	Current at Rated Power, Imp (A)	Open Circuit Voltage Voc (V) +/-3%	Short Circuit Current, Isc (A) +/-3%	Current Temp. Coeff. %/°C	Voltage Temp. Coeff. %/°C	Power Temp. Coeff. %/°C	System Safety Class
SPR-X22-485-COM	485	78.8	6.16	92.7	6.55	0.058	-0.236	-0.27	II
SPR-X21470-COM	470	77.6	6.06	91.5	6.45	0.058	-0.236	-0.27	II
SPR-X21350-BLK	350	57.3	6.11	68.2	6.50	0.058	-0.236	-0.27	II
SPR-X21335-BLK	335	57.3	5.85	67.9	6.23	0.058	-0.236	-0.27	II
SPR-MAX3-400	400	65.8	6.08	75.6	6.58	0.058	-0.236	-0.27	II
SPR-MAX3-395	395	65.4	6.04	75.6	6.57	0.058	-0.236	-0.27	II
SPR-MAX3-390	390	65.0	6.00	75.5	6.56	0.058	-0.236	-0.27	II
SPR-MAX3-380	380	64.1	5.93	75.4	6.55	0.058	-0.236	-0.27	II
SPR-MAX3-400-COM	400	66.0	6.07	75.4	6.57	0.058	-0.236	-0.27	II
SPR-MAX3-395-COM	395	65.1	6.07	75.4	6.56	0.058	-0.236	-0.27	II
SPR-MAX3-390-COM	390	64.5	6.05	75.3	6.55	0.058	-0.236	-0.27	II
SPR-MAX3-380-COM	380	63.1	6.02	75.2	6.54	0.058	-0.236	-0.27	II
SPR-MAX3-375-BLK	375	64.0	5.86	75.5	6.30	0.058	-0.236	-0.27	II
SPR-MAX3-355-BLK	355	60.7	5.85	75.3	6.27	0.058	-0.236	-0.27	II
SPR-MAX3-420-BLK-R	420	35.5	11.82	40.7	12.65	0.058	-0.236	-0.27	II
SPR-MAX3-415-BLK-R	415	35.3	11.75	40.7	12.64	0.058	-0.236	-0.27	II
SPR-MAX3-410-BLK-R	410	35.1	11.68	40.7	12.63	0.058	-0.236	-0.27	II
SPR-MAX3-405-BLK-R	405	34.9	11.61	40.7	12.62	0.058	-0.236	-0.27	II
SPR-MAX3-430-R	430	35.1	12.25	40.7	13.15	0.058	-0.236	-0.27	II
SPR-MAX3-425-R	425	34.9	12.18	40.7	13.13	0.058	-0.236	-0.27	II
SPR-MAX3-415-R	415	34.5	12.03	40.6	13.10	0.058	-0.236	-0.27	II
SPR-MAX6-425-BLK	425	40.3	10.58	48.2	11.32	0.058	-0.236	-0.27	II
SPR-MAX6-420-BLK	420	40.0	10.49	48.2	11.30	0.058	-0.236	-0.27	II
SPR-MAX6-410-BLK	410	39.5	10.37	48.1	11.28	0.058	-0.236	-0.27	II
SPR-MAX6-480-COM	480	44.2	10.87	52.6	11.58	0.060	-0.239	-0.30	II
SPR-MAX6-475-COM	475	43.9	10.82	52.6	11.57	0.060	-0.239	-0.30	II
SPR-MAX6-460-COM	460	43.2	10.64	52.5	11.54	0.060	-0.239	-0.30	II
SPR-MAX6-450-COM	450	42.8	10.52	52.4	11.51	0.060	-0.239	-0.30	II

Module	Rated Power (W) +5/-0%	Voltage at Rated Power Vmpp (V)	Current at Rated Power, Imp (A)	Open Circuit Voltage Voc (V) +/-3%	Short Circuit Current, Isc (A) +/-3%	Current Temp. Coeff. %/°C	Voltage Temp. Coeff. %/°C	Power Temp. Coeff. %/°C	System Safety Class
SPR-MAX6-440	440	40.5	10.87	48.2	11.58	0.058	-0.236	-0.27	II
SPR-MAX6-435	435	40.3	10.82	48.2	11.57	0.058	-0.236	-0.27	II
SPR-MAX6-430	430	40.0	10.74	48.2	11.56	0.058	-0.236	-0.27	II
SPR-MAX6-425	425	39.8	10.68	48.1	11.55	0.058	-0.236	-0.27	II
SPR-MAX6-420	420	39.6	10.62	48.1	11.53	0.058	-0.236	-0.27	II

4.0 Electrical Connections and System Monitoring

Modules may be connected in series and/or parallel to achieve the desired electrical output as long as optimum design parameters are achieved. Please use only the same type of modules in a combined source circuit. Do not mix the modules with different nameplates without authorization by Maxeon.

Even if allowed by local regulation, Plug and Socket connectors mated together in a PV system must be of the same type (model, rating) from the same manufacturer i.e. a plug connector from one manufacturer and a socket connector from another manufacturer, or vice versa, shall not be used to make a connection. Currently approved compatible connectors are: Tyco, Model PV4-S1M4/F4 or Staubli, Model PV-KST4 and KBT4/6II-UR.

Maxeon recommends a conservative minimum bending radius (R) 5x cable diameter must be maintained and must not be bent on the direct exit of the connector or junction box. Avoid exposure of electrical connections to direct sunlight and do not place the connector in a location where water could easily accumulate. Installers must refer to connector manufacturer's instruction for further installation and connection requirements. Connectors are factory assembled with intentional gaps between the cable nut and the body of the connector. Do not retighten module connector nuts as this may lead to stress cracking of the connector assembly and will void the warranty.

4.1 Equipment Grounding

To reduce the possibility of electrical shock, ground the frame of the module or array per NEC before wiring the circuit. In order to install in accordance with their UL Listing, Maxeon modules must be grounded using grounding hardware that meets requirements for grounding systems in UL 61730 and UL 61215 on anodized aluminum frames. Maxeon recommends to refer to the applicable regional and local codes and requirements on grounding PV arrays and mounting frames in conjunction with your racking supplier.

In addition, to avoid corrosion due to the use of dissimilar metals Maxeon recommends stainless steel between copper and aluminum.

4.2 System Grounding

Review Table 2 below for the proper grounding techniques for the installation of your particular Maxeon modules.

4.3 Series Connection

The modules may be wired in series to produce the desired voltage output. Do not exceed the maximum system voltage shown in module datasheets and product label.

¹ For models not shown here, please contact Maxeon technical support or visit www.maxeon.com/us. Electrical parameters are measured at Standard Test Conditions (STC). The series fuse must have an interrupting rating that is equal to or greater than the

maximum fault current that the fuse is required to interrupt, including contributions from all connected sources of energy. Refer to NEC Article 100, Part II as to what type of series fuse is acceptable for modules rated at higher than 600 V dc system voltage.

4.4 Parallel Connection

The modules may be combined in parallel to produce the desired current output. Each series string or module may be required to be fused prior to combining with other strings if the resulting maximum fuse size allowed (number of modules which can be connected in parallel and protected by one fuse) exceeds the fuse rating as shown in the module datasheet and product label. Please refer to the NEC Article 690 for additional fusing requirements.

Table 2: Module Grounding Key

Module Model Grounding Key
Maxeon modules have no grounding restrictions:
All model numbers starting with SPR-Xyy-XXX-BLK, SPR-Xyy-XXX-COM, SPR-MAX3-XXX, SPR-MAX3-XXX-BLK, SPR-MAX3-XXX-COM, SPR-MAX3-xxx-R, SPR-MAX3-xxx-BLK-R, SPR-MAX6-xxx, SPR-MAX6-xxx-COM
<i>IMPORTANT! Failure to comply with this requirement will reduce system performance and invalidate Maxeon's Limited Power Warranty for PV Modules.</i>

5.0 Module Mounting

The Maxeon Limited Warranty for PV Modules is contingent upon modules being mounted in accordance with the requirements described in this section.

5.1 Site Considerations

Maxeon modules should only be mounted in locations that meet the following requirements:

Operating Temperature: All Maxeon modules must only be mounted in environments that ensure they will operate within the following temperatures:

Operating Temperature range (ambient)	-40°C to +85 °C -40°F to +185 °F
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Adequate ventilation should be provided behind the modules, especially in hot environments.

Shading: Modules should be installed so that permanent shading of cells is avoided and partial shading that may occur during certain times of the day or year is minimized. Permanent shading is defined as shade that is cast over the same position (of constant area) of the solar module throughout the generation hours of the day. Shading may induce in certain cases strong energy production reduction, even in case of small shading and should be avoid as much as possible, especially at mid-day when the production is maximum.

Design Strength: Maxeon modules are designed to meet a positive (downward) and/or negative (upward) withstanding test pressure load, as per IEC 61215, when mounted as per the guidelines in Section 5.2 and configurations in Appendix. Test loads are for information purposes only; design loads should be considered for the project design.

When mounting modules in snow prone or high wind environments, special care should be taken to mount the modules in a manner that provides sufficient design strength while meeting local code requirements.

Additional authorized Operating Environments:

Modules can be mounted in the following aggressive environment according to the test limits mentioned below

Salt mist corrosion testing: IEC 61701 Severity 6

Ammonia Corrosion Resistance: IEC 62716 Concentration: 6,667ppm

Modules are designed for a maximum altitude of 2000 m.

Excluded Operating Environments

Certain operating environments are not recommended for Maxeon modules, and are excluded from the Maxeon Limited Warranty. No Maxeon module should be mounted at a site where it may be subject to direct contact with salt water, or other aggressive environment.

Modules should not be installed near flammable liquids, gases, or locations with hazardous materials; or moving vehicles of any type.

5.2 Mounting Configurations

Modules integrated into or mounted over a roofing system must be mounted over a fire-resistant roof covering rated for the application. Modules may be mounted at any angle, from horizontal to vertical. To reduce soiling, modules should be mounted at a minimum of 5 degrees.

Commercial modules (128 cells) frames have permanently attached stacking pins located in a 20mm zone on the long side frame at 388-408 mm from the corner. Mounting system hardware used with commercial modules must account for the presence of these stacking pins (see Appendix).

Specific information on module dimensions and the location of mounting and grounding holes is provided in Appendix. The system installer is responsible for the determination of location-specific load requirements.

In order to prevent water from entering the junction box, which could present a safety hazard, modules should be oriented with the junction box in the uppermost position and *not* be mounted such that the cell faces downward (e.g. on a tracking structure that positions the modules with the junction box facing skyward during sleep mode).

It should be noted that watertightness is not ensured by Maxeon, therefore, if water management is required, the mounting system should be designed accordingly.

Mixing panels with different AR glass SKUs is not recommended. Under some climactic conditions, the cosmetic impact of the panels appears dissimilar, which can result in an inhomogeneous appearance on the roof. AR glass type is in the SKU, for example: SPR-MAX3-430, ... AR-xx ..., where xx is the AR glass type. Mixing SKUs does not cause any technical or warranty issues; however, the customer must be informed and consent to any cosmetic differences that may arise.

Clearance between the module frames and structure or ground is required to prevent wiring damage and allows air to circulate behind the module. For all modules a minimum of 1.5" of clearance between the module frames and the structure (or grade) is required. The required minimum clearance between installed modules is 1/4". When installed on a roof, the module shall be mounted according to the local and regional building and fire safety regulations. In case the module is installed in a roof integrated PV-System (BIPV), it shall be mounted over a watertight and fire-resistant underlayment rated for such application.

Modules mounting systems should only be installed on buildings that have been formally considered for structural integrity, and confirmed to be capable of handling the additional weighted load of the Modules and mounting systems, by a certified building specialist or engineer.

Mounting system supplier shall manage the galvanic corrosion which can occur between the aluminum frame of the Modules and

mounting system or grounding hardware if such devices is comprised of dissimilar metals. The module is only certified for use when its factory frame is fully intact. Do not remove or alter the module frame. Creating additional mounting holes or removing the stacking pins may damage the module and reduce the strength of the frame, therefore are not allowed. Using mounting Clamps or clips with additional grounding bolts or grounding metal sheets could be in compliance with this Safety and Installation Instructions manual subject to conditions of Section 4.1

Modules may be mounted using the following methods only:

- 1) **Frame Holes:** Secure the module to the structure using the factory mounting holes. Four 1/4" stainless steel bolts, with nuts, washers, and lock washers are recommended per module; tightened to a min. torque of 10 in-lb. This method has been certified by a third-party organization according to UL 1703. For frame hole mounting, modules must be secured using the holes shown in Appendix.

- 2) **Clamps:** Mount the module with the opposite clamps on the longer and/or shorter sides of the module. The clips allowed location should be according to Appendix. Installers should ensure the clamps are of sufficient strength to allow for the maximum design pressure of the module. Clamps are not provided by Maxeon.

Clamps must apply force collinear with the 'wall' of the module frame and not only to the top flange. Clamps shall not apply excessive force to the top frame, warp the top flange or contact the glass-these practices void the module warranty and risk glass breakage. **Figure 1a** illustrates locations for top frame clamp force.

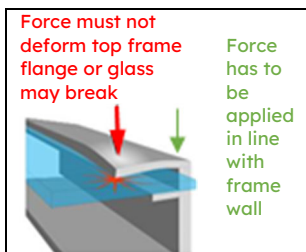


Figure 1a: Clamp Force Locations

When clamping to the module frame, torque should never exceed 132 in-lbs (15 Nm) to reduce chances of frame deformation and/or glass breakage. If the clamp manufacturer recommends a specific torque value which is lower than 132 in-lbs (15 Nm), the installer should use the clamp manufacturer's torque value. If the clamp manufacturer recommends a specific torque value which is higher than 132 in-lbs (15 Nm), the installer should contact the clamp manufacturer for acceptance of the 132 in-lbs (15 Nm) maximum torque value or to find alternative clamps. A calibrated torque wrench must be used. Mounting systems should be evaluated for compatibility before installing, especially when the system is not using Clamps or clip.

Minimum clamp width is $\geq 25\text{mm}$ for corner clamping. Clamps should not be in contact with the front glass and clamps should not deform the frame.

Maxeon does not recommend nor endorse the application on the modules of clamps which, as part of their grounding or earthing function, have teeth or claw features (see Figure 2) which may, individually or cumulatively, cause the module breakage due to (and without limitation):

- i. the grounding features touching the front glass which is incorporated into the module due to the position of such grounding feature,
- ii. the shape, the position or the number of the grounding features deforming the module top frame, or
- iii. the clamp being over-torqued during the installation.

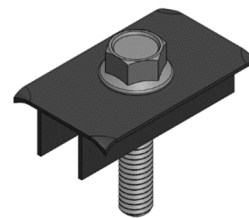


Figure 2

Maxeon shall not be liable for any damages or losses whatsoever arising from the use by the Installer of any such clamps on its modules, and disclaims all warranties, express or implied, applicable to those modules should they be damaged in any way by such clamps. Therefore, the use of the above mentioned clamps by the Installer is at the Installer's sole risks.

5.2 Module Handling During Installation

Do not place modules face forward in direct contact with abrasive surfaces like roofs, driveways, wooden pallets, railings, stucco walls, etc...

The module front surface glass is sensitive to oils and abrasive surfaces, which may lead to scratches and irregular soiling. During storage, modules need to be protected from rain or any kinds of liquids. Required storage temperature is between 10°C to 40°C in a dry environment (humidity between 30 to 80%). Do not store modules outdoor to avoid moisture and wet conditions.

Modules that feature antireflective coated glass are prone to visible finger print marks if touched on the front glass surface. Maxeon recommends handing modules with anti-reflective glass with gloves (no leather gloves) or limiting touching of the front surface. Any finger print marks resulting from installation will naturally disappear over time or can be reduced by following the washing guidelines in Section 6.0 below. Any module coverage (colored plastic tarps or similar) during installation can lead to permanent front glass discoloration and is not recommended. The use of vacuum lifting pads can cause permanent marks on the front glass. When a residential installation (with "RES" in the description) is designed/planned using SunPower/Maxeon modules with different Part Numbers (SKU's), in order to minimise cosmetic differences between modules, please ensure the anti-reflective supplier of the modules are identical. This can be done by referring to the product description, and looking for AR-XX, where "XX" denotes the supplier and these characters shall be all identical.

Never lift or move the module using the cables or the junction box under any-circumstances. Ties or tapes used to secure cables are designed for transportation. They are not designed to comply with local requirements for securing PV cable to the array, and may cause shading on bifacial panels reducing performance.

System energization and shutdown procedures need to be followed based on respective National guidelines and local regulations. Safe site operational practices must be adhered before energizing the PV system (e.g. electrical continuity, avoiding direct contact with electrical/framing equipment, wearing safety PPE, etc.). System should be electrically disconnected during maintenance, upgrades, and modification works which can affect the operation of PV system.

Systems should be disconnected in any cases of maintenance which can cause shading (e.g. chimney sweeping, any roof maintenance, antenna/dish installations, etc).

6.0 Maintenance and Cleaning

Trained Maxeon dealer or trained Maxeon support personnel should inspect all modules annually for safe electrical connections, sound mechanical connections, and freedom from corrosion.

Periodic cleaning of module glass has resulted in improved performance levels, especially in regions with low levels of annual precipitation; therefore Maxeon recommends periodic cleaning of the modules.

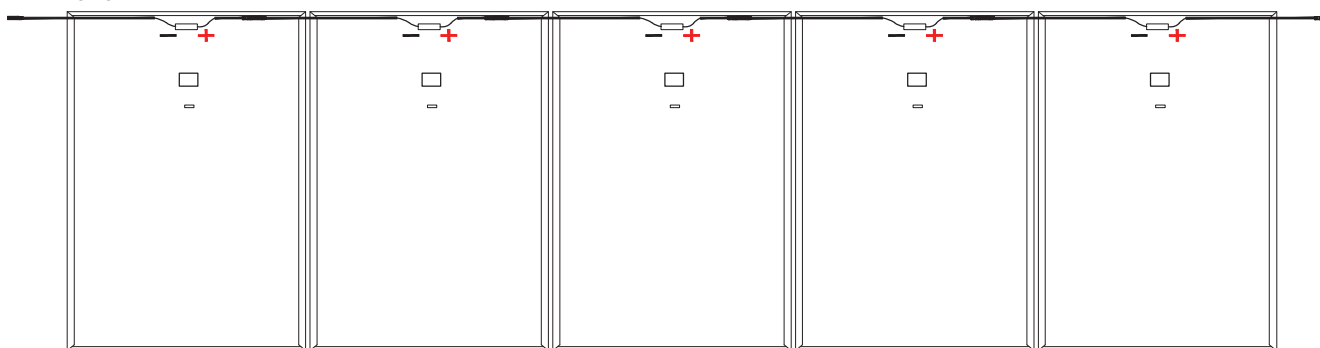
To clean a module, wash its glass surface with potable, non-heated water. Normal water pressure is adequate when cleaning the AR glass. Some fingerprints, stains, or accumulations of dirt on the glass may be removed with over-the-counter glass cleaners (such as Windex® or equivalent), or with a 3% soap-and-water solution. For smaller systems, wet the module glass with the solution, let it stand for five minutes, and then wet them again and use a soft sponge or seamless cloth to wipe the glass surface in a circular motion. For large systems, wet the modules with the cleaning solution, let them stand for five minutes, and then rinse them with high-pressure water or a soft squeegee. Do not use harsh industrial-strength

cleaning materials such as scouring powder, steel wool, scrapers, blades, or other sharp instruments to clean the module glass. Use of such materials will void the product warranty.

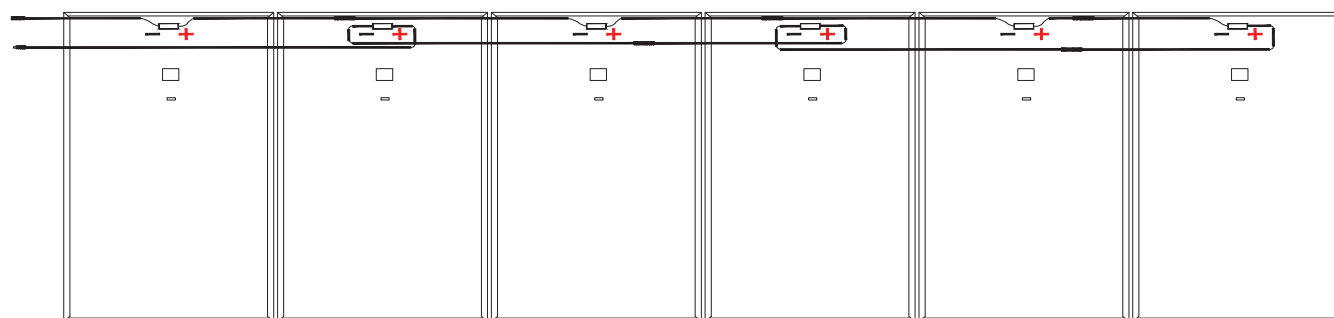
Recommended Cable Management

Maxeon Product Line:

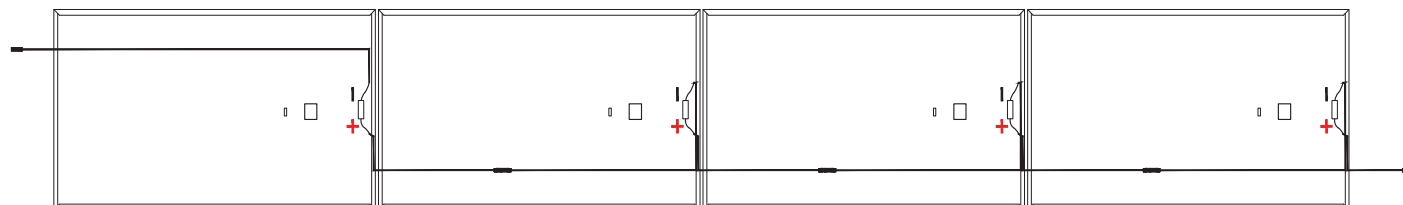
Portrait Stringing



Leapfrog Stringing (Portrait)

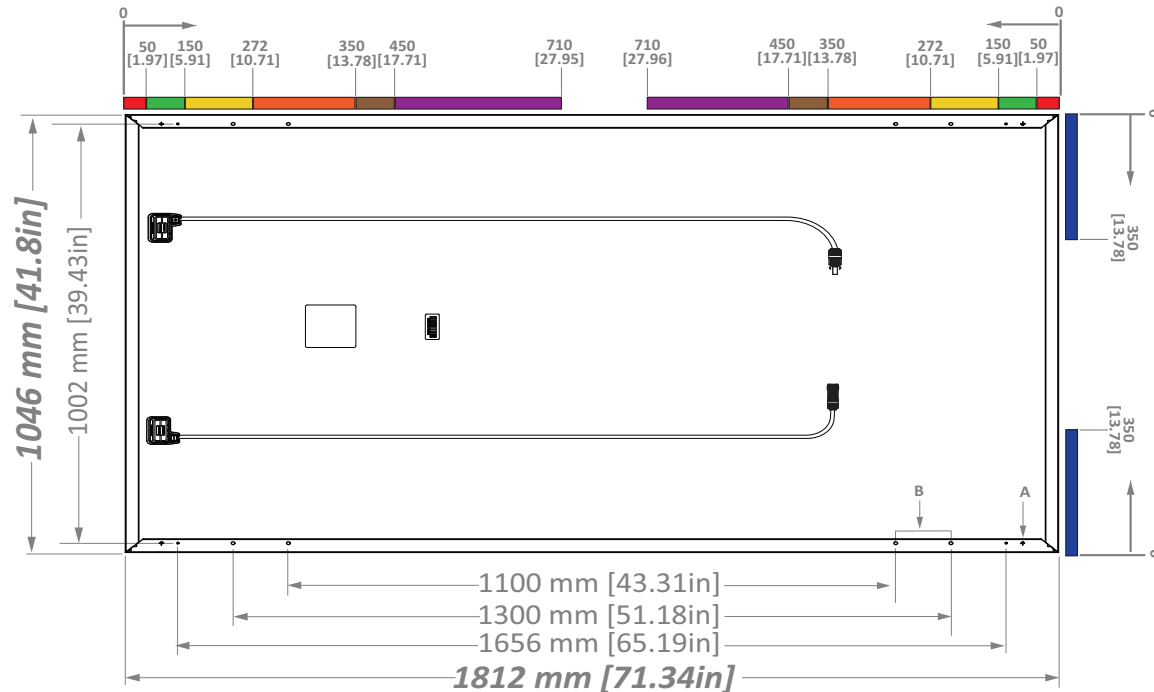


Landscape Stringing



***The image is for illustration purposes only**

Appendix: Mounting Configurations and Load Ratings

Maxeon 3 112 cells AC Ready Solar Panel
(SPR-MAX3-XXX-R, SPR-MAX3-XXX-BLK-R, SPR-MAX3-XXX-COM-R)

Measurement Tolerances are +/-3 mm for the Length and Width of the Module.

A - Ground Holes (4X Ø4.2mm)

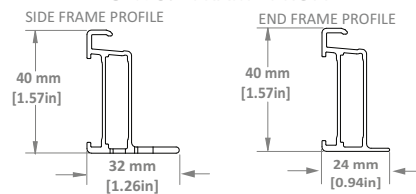
B - Mounting Holes (8X Ø6.8mm)

TOP CLAMPS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			50 - 150	+2700/-2700	+1800/-1800
			150 - 272	+3600/-3600	+2400/-2400
			272 - 450 ⁶	+5400/-5400	+3600/-3600
			450 - 710 ⁵	+3600/-2400	+2400/-1600
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			Outer Clamp: 403 - 503 Middle Clamp: 856 - 956	+7400/-7400	+4933/-4933
Long Side Mounting, Point Supported ⁷			50 - 150	+2700/-2700	+1800/-1800
			150 - 272	+3600/-3600	+2400/-2400
			272 - 450	+5400/-4200	+3600/-2800
			450 - 710	+3600/-2400	+2400/-1600
Long Side Mounting, Rails Parallel to Mounting Frame ⁸			50 - 150	+2700/-2700	+1800/-1800
			150 - 272	+3600/-3600	+2400/-2400
			272 - 450	+5400/-4200	+3600/-2800
			450 - 710	+3600/-2400	+2400/-1600
Short Side Mounting, Rails Perpendicular to Mounting Frame (End Mount) ⁴			0 - 350 ⁵	+2700/-2700	+1800/-1800
Short Side Mounting, Point Supported ⁷ (End Mount)			0 - 350	+2700/-2700	+1800/-1800
Short Side Mounting, Rails Parallel to Mounting Frame (End Mount)			0 - 350	+2700/-2700	+1800/-1800

¹ In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.
² Test loads are for information purposes only, design loads should be considered for the project design.
³ Design Load considers 1.5 Factor of Safety, Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

GEN 5.2 FRAME PROFILE

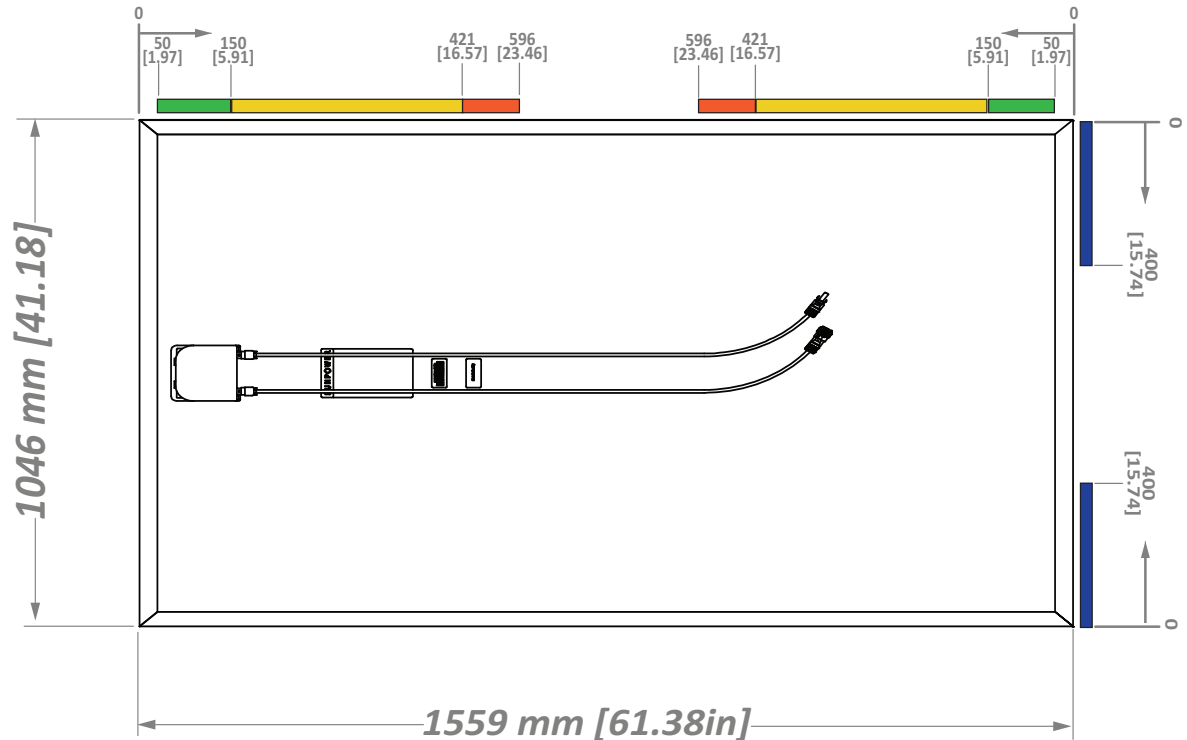


BOLTS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Holes Locations	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame			1300mm Holes	+5400/-5400	+3600/-3600
			1100mm Holes	+5400/-5400	+3600/-3600
Long Side Mounting, Point Supported			1300mm Holes	+5400/-5400	+3600/-3600
			1100mm Holes	+5400/-5400	+3600/-3600

⁴ Rails must not be under the junction box.
⁵ Covered under IEC 61730 Cert Test for 104 cell
⁶ For High Velocity Hurricane Zone (HVHZ), the modules achieved the required test loads. For hurricane zone building code requirements, please check with your installer.
⁷ Bottom flange mounting.
⁸ Range indicates the positioning of the clamps and not the rail

Maxeon 3 96-cell Residential Solar Panel (SPR-Xyy-XXX-BLK)

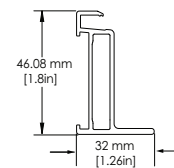


TOP CLAMPS

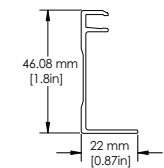
Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			50 - 150	+4500/-4500	+3000/-3000
			150 - 421	+5400/-5400	+3600/-3600
			421 - 596	+3600/-3600	+2400/-2400
Long Side Mounting, Point Supported ⁵			50 - 150	+4500/-4500	+3000/-3000
			150 - 421	+5400/-5400	+3600/-3600
			421 - 596	+3600/-3600	+2400/-2400
Long Side Mounting, Rails Parallel to Mounting Frame ⁶			50 - 150	+4500/-4500	+3000/-3000
			150 - 421	+5400/-5400	+3600/-3600
			421 - 596	+3600/-3600	+2400/-2400
Short Side Mounting, Rails Perpendicular to Mounting Frame			0 - 400	+4500/-4500	+3000/-3000
Short Side Mounting, Point Supported ⁵			0 - 400	+4500/-4500	+3000/-3000
Short Side Mounting, Rails Parallel to Mounting Frame			0 - 400	+4500/-4500	+3000/-3000

GEN 5.0 FRAME PROFILE

SIDE FRAME PROFILE



END FRAME PROFILE



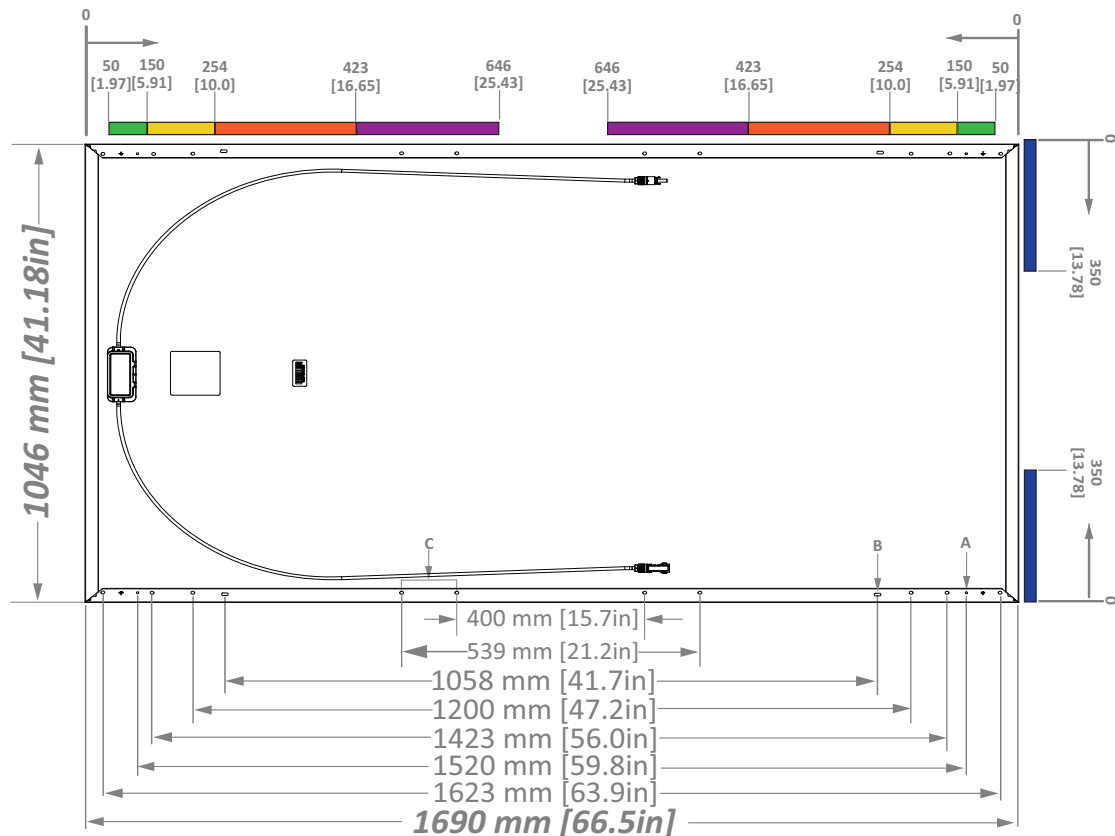
1 In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.
2 Test loads are for information purposes only, design loads should be considered for the project design.
3 Design Load considers 1.5 Factor of Safety, Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

4 Rails must not be under the junction box.

5 Bottom flange mounting.

6 Range indicates the positioning of the clamps and not the rails.

Maxeon 3 104 cells Commercial Solar Panel (SPR-MAX3-XXX-COM)



TOP CLAMPS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			50 - 150	+2700/-2700	+1800/-1800
			150 - 254	+3600/-3600	+2400/-2400
			254 - 423 ⁵	+5400/-5400	+3600/-3600
			423 - 646 ⁵	+3600/-3600	+2400/-2400
Long Side Mounting, Point Supported ⁶			50 - 150	+2700/-2700	+1800/-1800
			150 - 254	+3600/-3600	+2400/-2400
			254 - 423	+5400/-5400	+3600/-3600
			423 - 646	+3600/-3600	+2400/-2400
Long Side Mounting, Rails Parallel to Mounting Frame ⁷			50 - 150	+2700/-2700	+1800/-1800
			150 - 254	+3600/-3600	+2400/-2400
			254 - 423	+5400/-5400	+3600/-3600
			423 - 646	+3600/-3600	+2400/-2400
Short Side Mounting, Rails Perpendicular to Mounting Frame (End Mount) ⁴			0 - 350 ⁵	+2700/-2700	+1800/-1800
Short Side Mounting, Point Supported (End Mount) ⁶			0 - 350	+2700/-2700	+1800/-1800
Short Side Mounting, Rails Parallel to Mounting Frame (End Mount)			0 - 350	+2700/-2700	+1800/-1800

1 In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.
2 Test loads are for information purposes only, design loads should be considered for the project design.
3 Design load considers 1.5 Factor of Safety, Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

A - Ground Holes (4X Ø4.2mm)

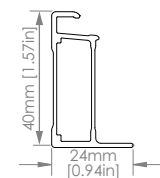
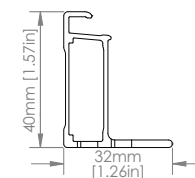
B - SLOTS (4X 5.0mm(W) x 15mm (L))

C - Mounting Holes (20X Ø6.8mm)

GEN 4.2 FRAME PROFILE

SIDE FRAME PROFILE

END FRAME PROFILE



BOLTS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Holes Locations	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame			1423mm Holes	+8100/-5400	+5400/-3600
			1200mm Holes	+8100/-5400	+5400/-3600
			539mm Holes	+5400/-3600	+3600/-2400
			400mm Holes	+5400/-3600	+3600/-2400
Long Side Mounting, Point Supported			1423mm Holes	+5400/-5400	+3600/-3600
			1200mm Holes	+5400/-5400	+3600/-3600
			539mm Holes	+3600/-3600	+2400/-2400
			400mm Holes	+3600/-3600	+2400/-2400

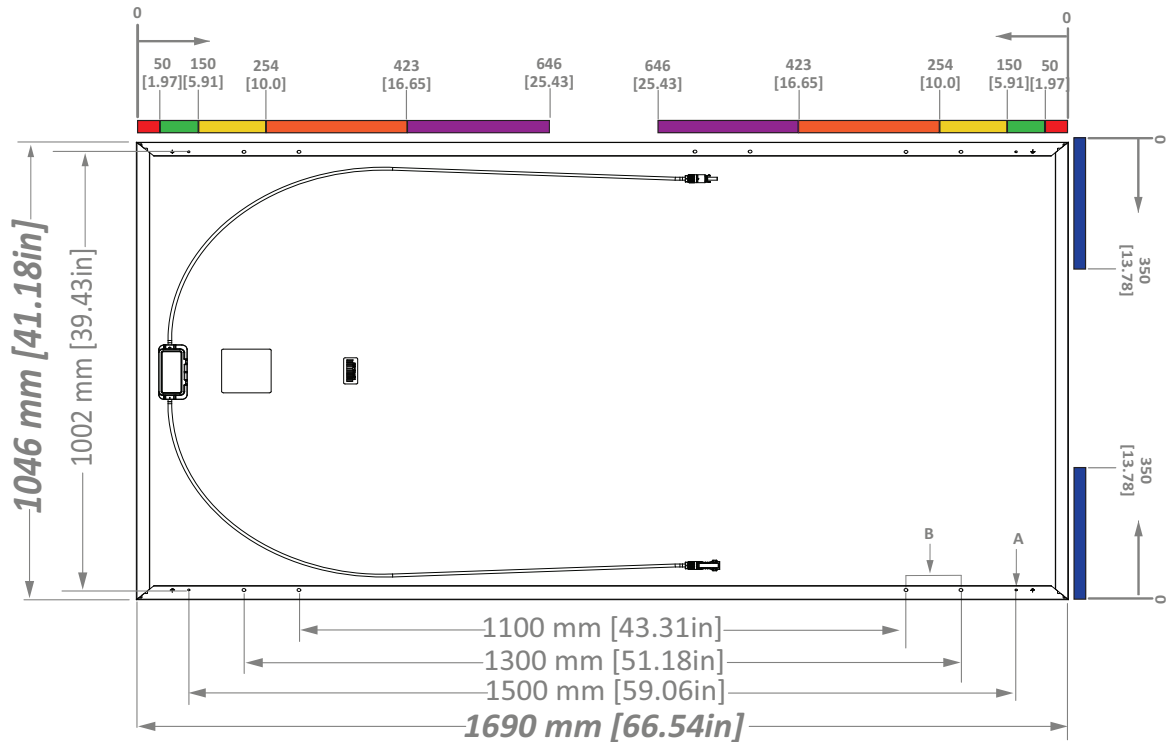
4 Rails must not be under the junction box.

5 IEC 61730 Cert Tested

6 Bottom flange mounting.

7 Range indicates the positioning of the clamp and not the rail

Maxeon 3 104 cells Residential Solar Panel (SPR-MAX3-XXX, SPR-MAX3-XXX-BLK)



A - Ground Holes (4X Ø4.2mm)
B - Mounting Holes (8X Ø6.8mm)

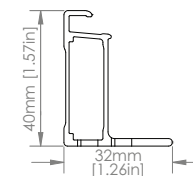
TOP CLAMPS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			50 - 150	+2700/-2700	+1800/-1800
			150 - 254	+3600/-3600	+2400/-2400
			254 - 423	+5400/-5400	+3600/-3600
			423 - 646	+3600/-3600	+2400/-2400
Long Side Mounting, Point Supported ⁶			50 - 150	+2700/-2700	+1800/-1800
			150 - 254	+3600/-3600	+2400/-2400
			254 - 423	+5400/-5400	+3600/-3600
			423 - 646	+3600/-3600	+2400/-2400
Long Side Mounting, Rails Parallel to Mounting Frame ⁷			50 - 150	+2700/-2700	+1800/-1800
			150 - 254	+3600/-3600	+2400/-2400
			254 - 423	+5400/-5400	+3600/-3600
			423 - 646	+3600/-3600	+2400/-2400
Short Side Mounting, Rails Perpendicular to Mounting Frame (End Mount) ⁴			0 - 350 ⁵	+2700/-2700	+1800/-1800
Short Side Mounting, Point Supported (End Mount) ⁶			0 - 350	+2700/-2700	+1800/-1800
Short Side Mounting, Rails Parallel to Mounting Frame (End Mount)			0 - 350	+2700/-2700	+1800/-1800

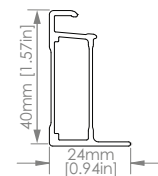
1 In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.
2 Test loads are for information purposes only, design loads should be considered for the project design.
3 Design Load considers 1.5 Factor of Safety, Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

GEN 4.2 FRAME PROFILE

SIDE FRAME PROFILE



END FRAME PROFILE

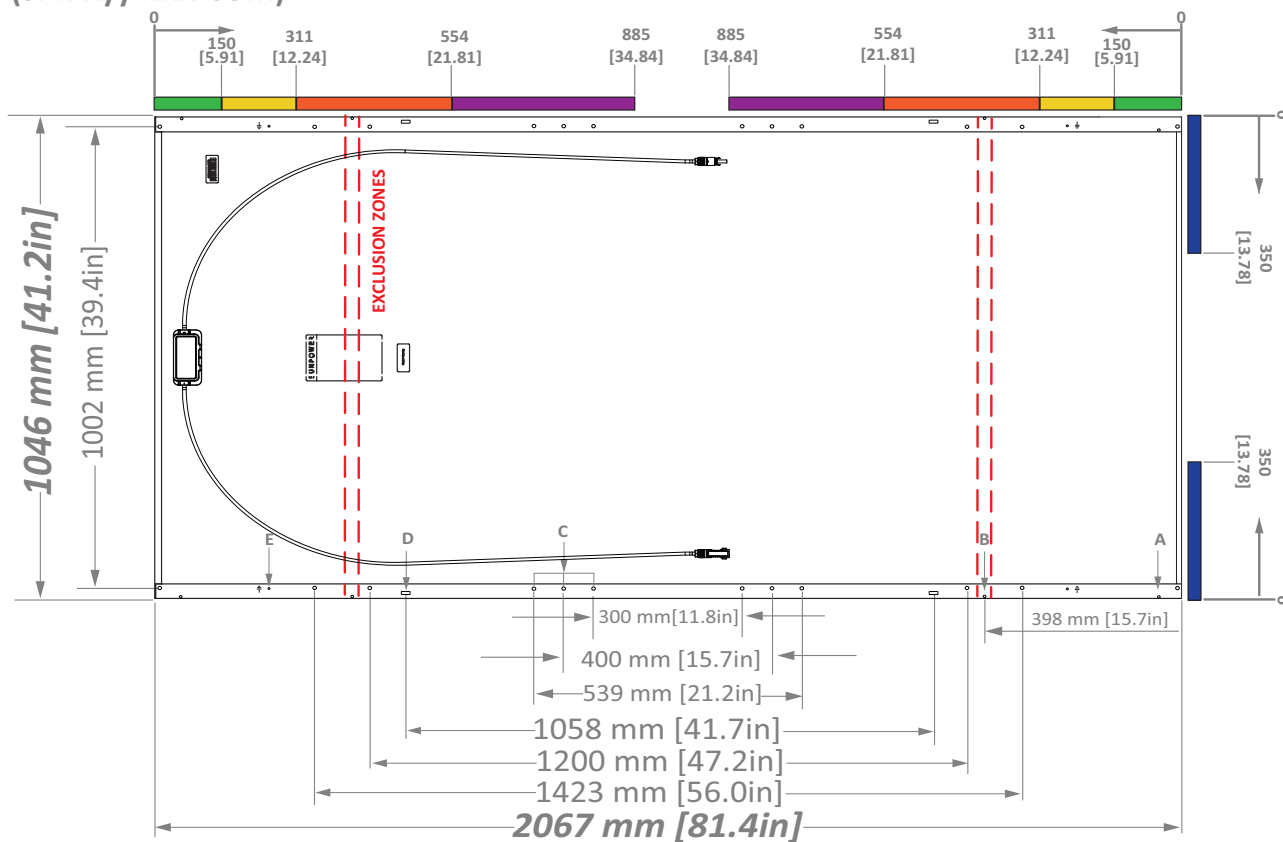


BOLTS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Holes Locations	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame			1300mm Holes	+8100/-5400	+5400/-3600
			1100mm Holes	+8100/-5400	+5400/-3600
Long Side Mounting, Point Supported			1300mm Holes	+5400/-5400	+3600/-3600
			1100mm Holes	+5400/-5400	+3600/-3600

4 Rails must not be under the junction box.
5 IEC 61730 Cert Tested
6 Bottom flange mounting.
7 Range indicates the positioning of the clamp and not the rail

Maxeon 3 128 cells Solar Panel (SPR-Xyy-XXX-COM)



Measurement Tolerances are +/-3 mm for the Length and Width of the Module.

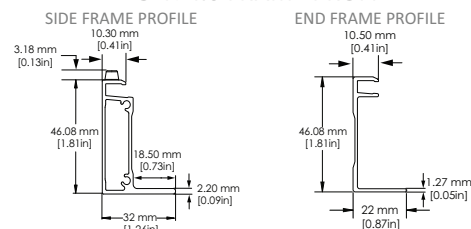
TOP CLAMPS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			0 - 150	+2000/-2000	+1333/-1333
			150 - 311	+5400/-3600	+3600/-2400
			311 - 554 ⁵	+5400/-3600	+3600/-2400
			554 - 885	+5400/-3600	+3600/-2400
Long Side Mounting, Point Supported ⁶			0 - 150	+2000/-2000	+1333/-1333
			150 - 311	+3600/-3600	+2400/-2400
			311 - 554 ⁵	+5400/-3600	+3600/-2400
			554 - 885	+3600/-3600	+2400/-2400
Long Side Mounting, Rails Parallel to Mounting Frame ⁷			0 - 150	+2000/-2000	+1333/-1333
			150 - 311	+3600/-3600	+2400/-2400
			311 - 554 ⁵	+5400/-3600	+3600/-2400
			554 - 885	+5400/-3600	+2400/-2400
Short Side Mounting, Rails Perpendicular to Mounting Frame (End Mount) ⁴			0 - 350	+2400/-2400	+1600/-1600
Short Side Mounting, Point Supported (End Mount) ⁶			0 - 350	+2000/-2000	+1333/-1333
Short Side Mounting, Rails Parallel to Mounting Frame (End Mount)			0 - 350	+2400/-2400	+1600/-1600

1 In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.
2 Test loads are for information purposes only, design loads should be considered for the project design.
3 Design Load considers 1.5 Factor of Safety, Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

- A - Drainage Holes (4X Ø4.8mm)
- B - Stacking Pins (4X Ø6.10mm)
- C - Mounting Holes (24X Ø6.8mm)
- D - SLOTS (4X 5.0mm(W) x 15.0mm(L))
- E - Ground Holes (4X Ø4.2mm)

GEN 4.0 FRAME PROFILE

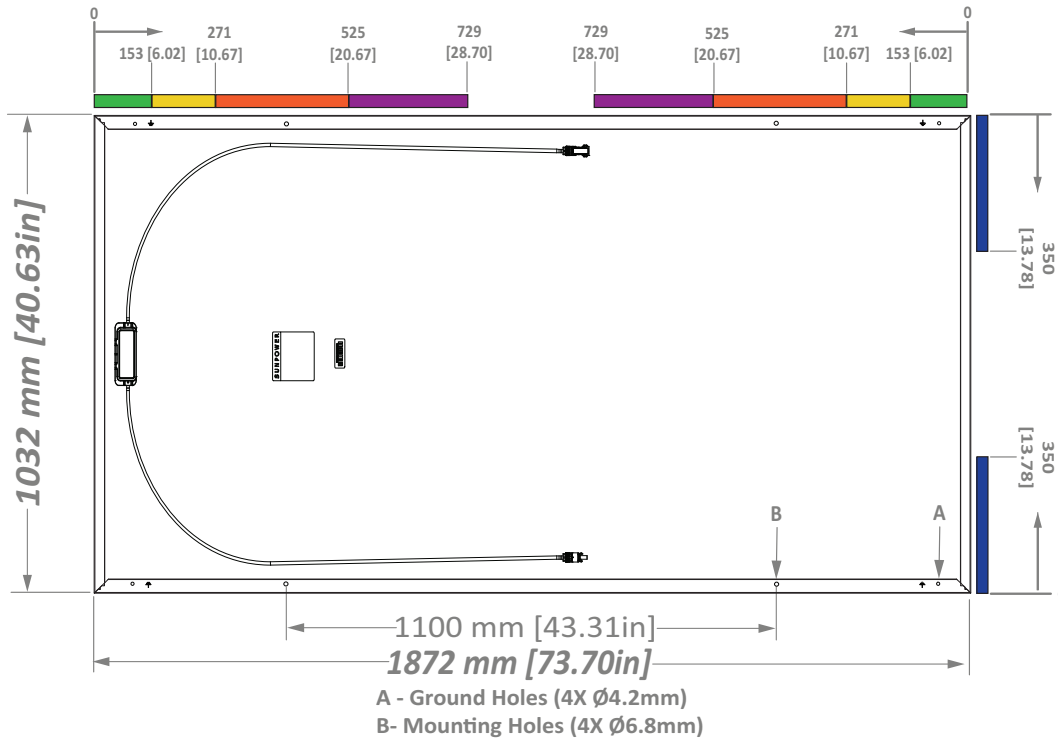


BOLTS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Holes Locations	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame			1423mm Holes	+5400/-3600	+3600/-2400
			1200mm Holes	+5400/-3600	+3600/-2400
			539mm Holes	+3600/-3600	+2400/-2400
			400mm Holes	+3600/-3600	+2400/-2400
			300mm Holes	+3600/-3600	+2400/-2400
Long Side Mounting, Point Supported			1423mm Holes	+5400/-3600	+3600/-2400
			1200mm Holes	+5400/-3600	+3600/-2400
			539mm Holes	+3600/-3600	+2400/-2400
			400mm Holes	+3600/-3600	+2400/-2400
			300mm Holes	+3600/-3600	+2400/-2400

4 Rails must not be under the junction box.
5 There is a 20mm zone at 388-408mm from the corner where mounting is not allowed due to the stacking pin.
6 Bottom flange mounting.
7 Range indicates the positioning of the clamps not the rails.

Maxeon 6 66 cells Residential Solar Panel (SPR-MAX6-XXX)



TOP CLAMPS

Measurement Tolerances are +/-3 mm for the Length and Width of the Module.

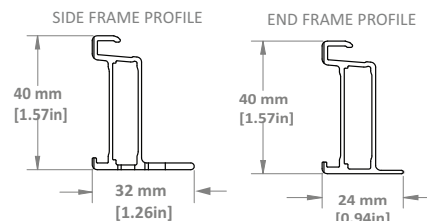
Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			0 - 153	+2400/-2400	+1600/-1600
			153 - 271	+2400/-2550	+1600/-1700
			271 - 525	+5400/-4050	+3600/-2700
			525 - 729	+2400/-2550	+1600/-1700
Long Side Mounting, Point Supported ⁵			0 - 153	+2400/-2400	+1600/-1600
			153 - 271	+2400/-2400	+1600/-1600
			271 - 525	+5400/-3600	+3600/-2400
			525 - 729	+2400/-2400	+1600/-1600
Long Side Mounting, Rails Parallel to Mounting Frame (End Mount) ⁶			0 - 153	+2400/-2400	+1600/-1600
			153 - 271	+2400/-2400	+1600/-1600
			271 - 525	+5400/-3600	+3600/-2400
			525 - 729	+2400/-2400	+1600/-1600
Short Side Mounting, Rails Perpendicular to Mounting Frame (End Mount) ⁴			0 - 350	+3600/-2400	+2400/-1600
Short Side Mounting, Point Supported (End Mount)			0 - 350	+2400/-2400	+1600/-1600
Short Side Mounting, Rails Parallel to Mounting Frame (End Mount)			0 - 350	+2400/-2400	+1600/-1600

1 In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.

2 Test loads are for information purposes only, design loads should be considered for the project design.

3 Design Load considers 1.5 Factor of Safety. Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

GEN 5.2 FRAME PROFILE



BOLTS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Holes Location	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame			1100mm Holes	+5400/-6000	+3600/-4000
Long Side Mounting, Point Supported			1100mm Holes	+5400/-5400	+3600/-3600

4 Rails must not be under the junction box.

5 Bottom flange mounting.

6 Range indicates the positioning of the the clamps not the rails.

SunPower

Solar Panels

Safety and Installation Instructions

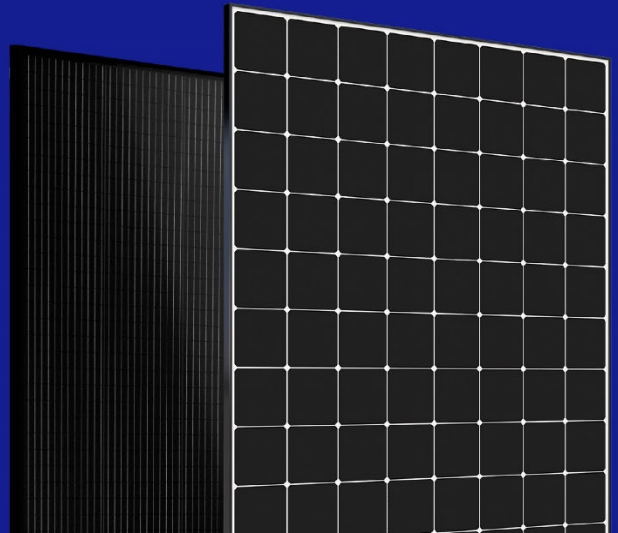
for

Europe, Asia, Australia, Latin America and Africa

SunPower

Maxeon and Performance

Photovoltaic panels



Safety and Installation Instructions

001-15497 Revision AB

PN 100657

Published December 2023

This document applies to Maxeon modules listed below:

- SPR-MAX6-XXX

These modules do not have grounding restrictions and all are compatible with high-efficiency transformer less inverters.

This document describes the limited warranty, mounting configuration, handling, maintenance and cleaning of modules. Save this documentation for future reference and comply with all provided instructions.



For the latest revision please refer to

www.sunpower.maxeon.com/int/PVInstallGuideIEC

Contents of this manual are subject to change without notice.

Maxeon Solar Technologies, Ltd.

www.sunpower.maxeon.com

SUNPOWER

FROM MAXEON SOLAR TECHNOLOGIES

Safety and Installation Instructions

(English - IEC version)

This document includes references to Maxeon SPR-MAX6-xxx PV Modules.
All module series does not require functional grounding and are compatible with transformer-less inverters (ref. section 4.1)

1.0 Introduction

This manual provides safety and installation instructions for IEC certified Maxeon photovoltaic modules carrying the TUV logo on the product label (Figure 1).



Figure 1

Important! Please read this instruction sheet in its entirety before installing, wiring, or using this product in any way. Failure to comply with these instructions will invalidate the Maxeon Limited Warranty for PV Modules.

1.1 Disclaimer of Liability

The installation techniques, handling and use of this product are beyond company control. Therefore, Maxeon does not assume responsibility for loss, damage or expense resulting from improper installation, handling or use.

1.2 Conformity to International Electrotechnical Commission (IEC) standards

This product meets or exceeds the requirements set forth by IEC 61215 Edition 3-2016 for PV Modules, as well as IEC 61730 Edition 1 and 2 series for Class II applications. The IEC Standard covers flat-plate PV modules intended for installation on buildings and those intended to be freestanding. This product is not intended for use where artificially concentrated sunlight is applied to the module. This manual shall be used in combination with industry recognized best practices. Modules should be installed by certified professionals only.

1.3 Limited Warranty

Module limited warranties are described in the Maxeon warranty document obtainable at www.sunpower.maxeon.com. Please read this document for more information.

Warranties do not apply to any of the following;

PV Modules subjected to: (i) misuse, abuse, neglect or accident; (ii) alteration or improper installation (improper installation includes, without limitation, installation or array that does not comply with all Maxeon installation instructions and operations and maintenance instructions of any type (as may be amended and updated from time to time at Maxeon's

sole discretion), and all national, state, and local laws, codes, ordinances, and regulations); (iii) repair or modification by someone other than an approved service technician of Maxeon; (iv) conditions exceeding the voltage, wind, snow load specifications; and any other operational specification; (v) power failure surges, lightning, flood, or fire; (vi) damage from persons, biological activity, or industrial chemical exposure; (vii) glass breakage from impact or other events outside Maxeon's control.

2.0 Safety Precautions

Before installing this device, read all safety instructions in this manual.

Danger! Module interconnects pass direct current (DC) and are sources of voltage when the module is under load and when it is exposed to light. ***Direct current can arc across gaps and may cause injury or death if improper connection or disconnection is made, or if contact is made with module components that are damaged.*** Do not connect or disconnect modules when current from the modules or an external source is present.

- Cover all modules in the PV array with an opaque cloth or material before making or breaking electrical connections.
- Do not disconnect any modules when its inverter is feeding in to the grid. Switch off the inverter before disconnecting, reinstalling or making any action with the modules.
- For connectors, which are accessible to untrained people, it is imperative to use the locking connectors and safety clips, if applicable, in order to defend against untrained personnel disconnecting the modules once they have been installed.
- All installations must be performed in compliance with all applicable regional and local codes.
- There are no user serviceable parts within the module. Do not attempt to repair any part of the module.
- Installation should be performed only by qualified personnel.
- Remove all metallic jewelry prior to installing this product to reduce the chance of accidental exposure to live circuits.
- Use insulated tools to reduce your risk of electric shock.
- Do not stand on, walk, drop, and scratch or allow objects to fall on the glass surface of the modules.
- Damaged modules (broken glass, torn back sheet, broken j-boxes, broken connectors, etc) can be electrical hazards as well as laceration hazards. Contact with damaged module surfaces or module frame can cause electric shock. Damaged modules should be immediately disconnected from the electric system. The module should be removed from array as soon as possible and contact the supplier for disposal instructions.
- Unconnected connectors must always be protected from pollution (e.g dust, humidity, foreign particles, etc), prior to installation. Do not leave unconnected (unprotected)

connectors exposed to the environment. A clean assembly environment is therefore essential to avoid performance degradation.

- Do not allow the connectors to come in contact with chemicals such as sunscreen, greases, oils and organic solvents which may cause stress cracking.
- Do not install or handle the modules when they are wet or during periods of high wind.
- Do not block drain holes or allow water to pool in or near module frames
- Contact your module supplier if maintenance is necessary.
- Save these instructions!

3.0 Electrical Characteristics

The module electrical ratings are measured under Standard Test Conditions (STC) of 1 kW/m² irradiance with AM 1.5 spectrum and a cell temperature of 25 °C. Maxeon modules have specific electrical characteristics as shown on the datasheets.

A photovoltaic module may produce more current and/or voltage than reported at STC. Sunny, cool weather and reflection from snow or water can increase current and power output. Therefore, the values of I_{sc} and V_{oc} marked on the module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacities, fuse sizes, and size of controls connected to PV output. An additional 1.25 multiplier may be required by certain local codes for sizing fuses and conductors. Maxeon recommends the use of open-circuit voltage temperature coefficients listed on the datasheets when determining Maximum System Voltage.

4.0 Electrical Connections

Modules may be connected in series and/or parallel to achieve the desired electrical output as long as certain conditions are met. Please use only the same type of modules in a combined source circuit.

Even if allowed by local regulation, Plug and Socket connectors mated together in a PV system must be of the same type (model, rating) from the same manufacturer i.e. a plug connector from one manufacturer and a socket connector from another manufacturer, or vice versa, shall not be used to make a connection. Maxeon recommends that all wiring be double insulated with a minimum rating of 85° C (185° F). All wiring should use flexible copper (Cu) conductors. The minimum size should be determined by the applicable codes. We recommend a size not less than 4mm². The insulation type should be appropriate for the type of installation method used and must meet SCII (Safety Class II) and IEC 61730 requirements. To minimize the risk from indirect lightning strikes (Voltage surges), the system should be designed to avoid loops in the wiring.

Maxeon recommends a conservative minimum bending radius (R) 5x cable diameter must be maintained and must not be bent on the direct exit of the connector or junction box. Avoid exposure of electrical connections to direct sunlight and do not place the connector in a location where

water could easily accumulate. Installers must refer to connector manufacturer's instruction for further installation and connection requirements.

Connectors are factory assembled with intentional gaps between the cable nut and the body of the connector. Do not retighten module connector nuts as this may lead to stress cracking of the connector assembly and will void the warranty.

4.1 System & Equipment Grounding

Please refer to the applicable regional and local codes on grounding PV arrays and mounting frames for specific requirements (e.g. lightning protection).

Module Types
Maxeon Product Line are compatible with Transformer Less (TL) inverters, when used as an ungrounded PV source. No frame grounding requirements (including functional frame grounding), but may be subjected to local regulation. Functional system grounding of a polarity (positive or negative) is optional and may be subject to local requirements.
Maxeon Product Line: SPR- MAX6 -xxx

Note: If you are installing an older Module Type than above mentioned, please refer to different/previous applicable Safety and Installation Manual.

If you are doing a frame grounding connection, avoid the direct contact between Aluminum and Copper using an intermediate metal like stainless steel or tin.

4.2 Series Connection

The modules may be wired in series to produce the desired voltage output. Do not exceed the maximum system voltage specified in module datasheet.

4.3 Parallel Connection

The modules may be combined in parallel to produce the desired current output. Series string must be fused prior to combining with other strings if the resulting maximum reverse current exceeds the fuse rating as shown in the datasheets. Bypass diodes are factory installed in the modules. Please refer to the applicable regional and local codes for additional fusing requirements and limitations on the maximum number of modules in parallel.

5.0 Module Mounting

The Maxeon **Limited** Warranty for PV Modules is contingent upon modules being mounted in accordance with the requirements described in this section.

5.1 Site Considerations

Maxeon modules should be mounted in locations that meet the following requirements:

Operating Temperature: All Maxeon modules must be mounted in environments within the following maximum and minimum operating temperatures:

Maximum Operating Temperature	+85 °C (+185 °F)
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Minimum Operating Temperature	-40 °C (-40 °F)
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Care should be taken to provide adequate ventilation behind the modules, especially in hot environments.

Shading: Modules should be installed so that permanent shading of cells is avoided and partial shading that may occur during certain times of the day or year is minimized. Permanent shading is defined as shade that is cast over the same position (of constant area) of the solar module throughout the generation hours of the day.

Shading may induce in certain cases strong energy production reduction, even in case of small shading and should be avoid as much as possible, especially at mid-day when the production is maximum.

Design Strength: Maxeon modules are designed to meet a positive or negative (upward and downward, e.g. wind) withstanding test pressure load and a negative (or downward, e.g. static load or snow load) withstanding test pressure load, as per IEC 61215, when mounted in the configurations specified in Appendix.

When mounting modules in snow prone or high wind environments, special care should be taken to mount the modules in a manner that provides sufficient design strength while meeting local code requirements.

Additional authorized Operating Environments:

Modules can be mounted in the following aggressive environment according to the test limits mentioned below (available upon request)

Salt mist corrosion testing: IEC 61701 Severity 6

Ammonia Corrosion Resistance: IEC 62716 Concentration: 6,667ppm

Excluded Operating Environments:

Certain operating environments are not recommended for specific Maxeon modules and are excluded from the Maxeon **Limited** Warranty for these modules.

No Maxeon module should be mounted at a site where it may be subject to direct contact with salt water, or other aggressive environment.

Modules should not be installed near flammable liquids, gases, or locations with hazardous materials; or moving vehicles of any type.

5.2 Mounting Configurations

Mounting system must provide a flat plane for the modules to be mounted on and must not cause any twist or stress to be placed on the Module, even in case of thermal expansion.

Mixing panels with different AR glass SKUs is not recommended. Under some climactic conditions, the cosmetic impact of the panels appears dissimilar, which can result in an inhomogeneous appearance on the roof. AR glass type is in the SKU, for example: SPR-MAX3-430, ... AR-xx ..., where xx is the AR glass type. Mixing SKUs does not cause any technical or warranty issues; however, the

customer must be informed and consent to any cosmetic differences that may arise.

Modules may be mounted at any angle from horizontal to vertical. Select the appropriate orientation to maximize sunlight exposure. Maxeon recommends for a good performance of the system (reduction of soiling effect/water pooling) a minimum of 5° tilt angle. The cleaning frequency must be increased for modules installed with a very low angle.

Mounting system hardware used with commercial modules must account for the presence of these stacking pins (Appendix).

Specific information on module dimensions and the location of mounting and grounding holes is provided in Appendix

In order to prevent water from entering the junction box, which could present a safety hazard, modules should not be mounted such that the front/top glass faces downward (e.g., on a tracking structure that positions the module with the junction box facing skyward during sleep mode).

It should be noted that the watertightness is not ensured by the modules but by the mounting system and that drainage should be well designed for modules.

Clearance between the module frames and structure or ground is required to prevent wiring damage and allows air to circulate behind the module. The recommended assembling clearance between modules installed on any mounting system is a minimum of 50 mm distance.

When installed on a roof, the module shall be mounted according to the local and regional building and fire safety regulations. In case the module is installed in a roof integrated PV-System (BIPV), it shall be mounted over a watertight and fire-resistant underlayment rated for such application

Modules mounting systems should only be installed on building that have been formally considered for structural integrity, and confirmed to be capable of handling the additional weighted load of the Modules and mounting systems, by a certified building specialist or engineer.

Mounting system supplier shall manage the galvanic corrosion which can occur between the aluminium frame of the Modules and mounting system or grounding hardware if such devices is comprised of dissimilar metals.

The module is only certified for use when its factory frame is fully intact. Do not remove or alter the module frame. Creating additional mounting holes or removing the stacking pins may damage the module and reduce the strength of the frame, therefore are not allowed. Using mounting Clamps or clips with additional grounding bolts or grounding metal sheets could be in compliance with this Safety and Installation Instructions manual subject to conditions of Section 4.1

Modules may be mounted using the following methods only:

- 1) **Frame Holes:** Secure the module to the structure using the factory mounting holes. Four M6 or M8 stainless steel bolts, with nuts, washers, and lock washers are recommended per module. Bolts to be fasten according to racking supplier recommendations. Refer to Appendix for the module dimensions and mounting hole locations.

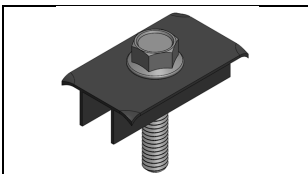


Figure 2

- 2) **Pressure Clamps or Clips:** Mount the module with the opposite clips on the longer and/or shorter side of the frame of the module. The clips allowed location should be according to Appendix. Installers should ensure the clamps are of sufficient strength to allow for the maximum design pressure of the module. Clips and clamps are not provided by Maxeon. Clamps must apply force collinear with the 'wall' of the module frame and not only to the top flange. Clamps shall not apply excessive force to the top frame, warp the top flange, or contact the glass—these practices void the module warranty and risk glass breakage. Figure 1a illustrates locations for top frame clamp force. Avoid clamping within 50mm of module corners to reduce risk of frame corner deflection and glass breakage. When clamping to the module frame, torque should never exceed 15 N.m to reduce chances of frame deformation, if the clamp datasheets show a specific torque value which is lower than 15 Nm the installer should follow the torque value whichever is more stringent. A calibrated torque wrench must be used. Mounting systems should be evaluated for compatibility before installing specially when the system is not using Clamps or clips. Please contact Maxeon for the approval of the use of non-standard pressure clamps or clips where torque values are higher than otherwise stated.

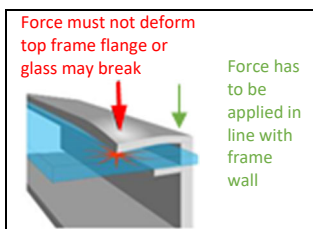


Figure 1a: Clamp Force Locations

Minimum clamp width is $\geq 25\text{mm}$ for corner clamping. Clamps should not be in contact with the front glass and clamps should not deform the frame.

Maxeon does not recommend nor endorse the application on the modules of clamps which, as part of their grounding or earthing function, have teeth or claw features (see Figure 2) which may, individually or cumulatively, cause the module breakage due to (and without limitation):

- i) the grounding features touching the front glass which is incorporated into the module due to the position of such grounding feature,

- ii) the shape, the position or the number of the grounding features deforming the module top frame, or
- iii) the clamp being over-torqued during the installation.

Maxeon shall not be liable for any damages or losses whatsoever arising from the use by the Installer of any such clamps on its modules, and disclaims all warranties, express or implied, applicable to those modules should they be damaged in any way by such clamps. Therefore, the use of the above mentioned clamps by the Installer is at the Installer's sole risks.

- 3) **End Mount:** End mounting is the capture mounting of the length of the module's shorter frames with clamps on each shorter sides of the frame. Three different configurations are possible: 1) with two mounting rails under the complete length of each shorter side of the Modules, with two mounting rails parallel to the long side of the Modules without any mounting rail (Appendix). The end-mounting rails and clips or clamps must be of sufficient strength to allow for maximum designed test pressure of the module. Verify this capacity with the mounting system of vendor before installation.
- 4) **Hybrid Mount:** Combination with clamps or clips located on longer or shorter sides of Modules are also possible, see Table 1.2 for allowed configurations. In any case, four clamping points are needed.
- 5) **Maxeon specified or Maxeon supplied mounting systems.** Modules mounted with strict adherence to Maxeon documentation, using hardware systems supplied by or specified by Maxeon.

5.6 Handling of Modules during Installation

Do not place modules face forward in direct contact with abrasive surfaces like roofs, driveways, wooden pallets, railings, stucco walls, etc...

The module front surface glass is sensitive to oils and abrasive surfaces, which may lead to scratches and irregular soiling.

During storage, modules need to be protected from rain or any kinds of liquids. Required storage temperature is between 10°C to 40°C in a dry environment (humidity between 30 to 80%). Do not store modules outdoor to avoid moisture and wet conditions.

Modules that feature antireflective coated glass are prone to visible finger print marks if touched on the front glass surface. Maxeon recommends handling modules with anti-reflective glass with gloves (no leather gloves) or limiting touching of the front surface. Any finger print marks resulting from installation will naturally disappear over time or can be reduced by following the washing guidelines in Section 6.0 below. Any module coverage (colored plastic tarps or similar) during installation can lead to permanent front glass discoloration and is not recommended. The use

of vacuum lifting pads can cause permanent marks on the front glass. When a residential installation (with “RES” in the description) is designed/planned using SunPower/Maxeon modules with different Part Numbers (SKU’s), in order to minimise cosmetic differences between modules, please ensure the anti-reflective supplier of the modules are identical. This can be done by referring to the product description, and looking for AR-XX, where “XX” denotes the supplier and these characters shall be all identical.

Never lift or move the module using the cables or the junction box under any-circumstances. Ties or tapes used to secure cables are designed for transportation. They are not designed to comply with local requirements for securing PV cable to the array, and may cause shading on bifacial panels reducing performance.

Shading incidence need to be avoided during PV system operation. The system is not supposed to be energized until the mounting scaffolding, fences or railing have been removed from the roof.

Systems should be disconnected in any cases of maintenance which can cause shading (e.g. chimney sweeping, any roof maintenance, antenna/dish installations, etc).

6.0 Maintenance

Maxeon recommends visual inspection on a regular basis of all modules for safe electrical connections, sound mechanical connection, and free from corrosion. This visual

inspection should be performed by trained personnel. The standard frequency is once a year according to environmental conditions, periodic cleaning of modules is recommended but is not required. Periodic cleaning has resulted in improved performance levels, especially in regions with low levels of annual precipitation (less than 46,3cm (18,25 inches)). Consult your dealer or supplier about recommended cleaning schedules for your area.

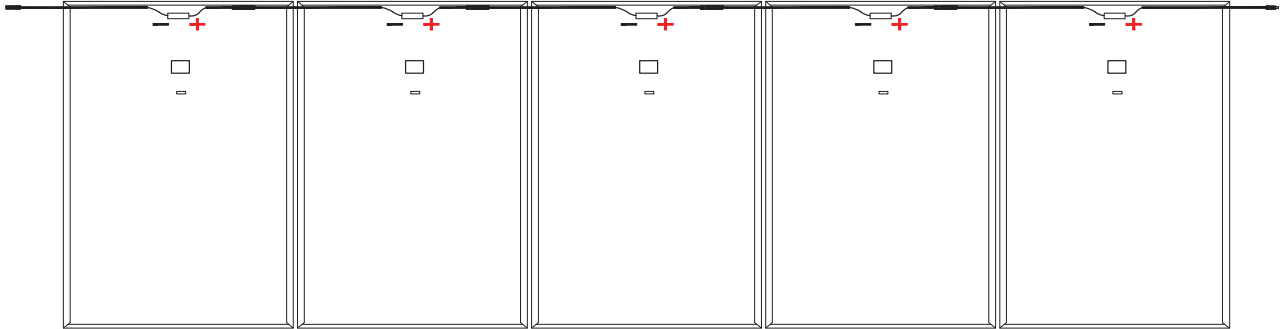
To clean a module, wash with potable, non-heated, water. Normal water pressure is more than adequate, but pressurized water up to 100 bar (min.50 cm distance) may be used. Maxeon recommends using a large hosepipe and not to perform cleaning at high outside temperatures. Fingerprints, stains, or accumulations of dirt on the front surface may be removed as follows: first rinse off area and let soak for a short period of time (5 mins). Re-wet and use a soft sponge or seamless cloth to wipe glass surface in a circular motion.

Fingerprints typically can be removed with a soft cloth or sponge and water after wetting. Do not use harsh cleaning materials such as scouring powder, steel wool, scrapers, blades, or other sharp instruments to clean the glass surface of the module. Use of such materials or cleaning without consultation will invalidate the product warranty. As dry cleaning is also risky for Anti-Reflective (AR) coated module surface, spinning brush is not recommended for module cleaning

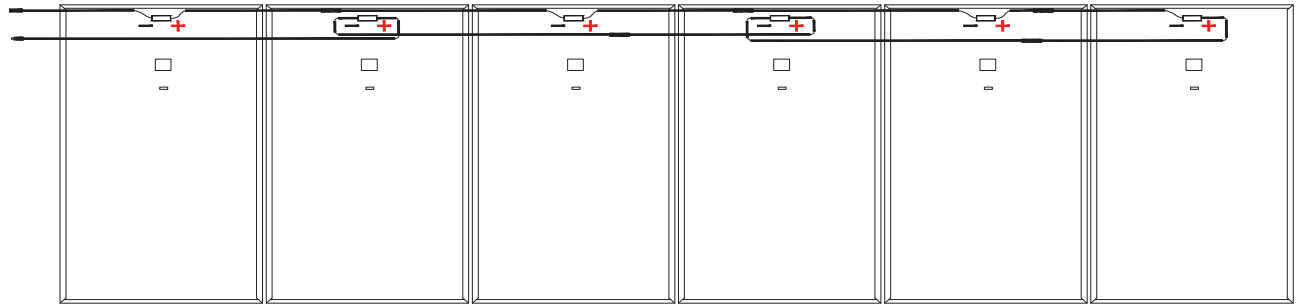
Recommended Cable Management

Maxeon Product Line:

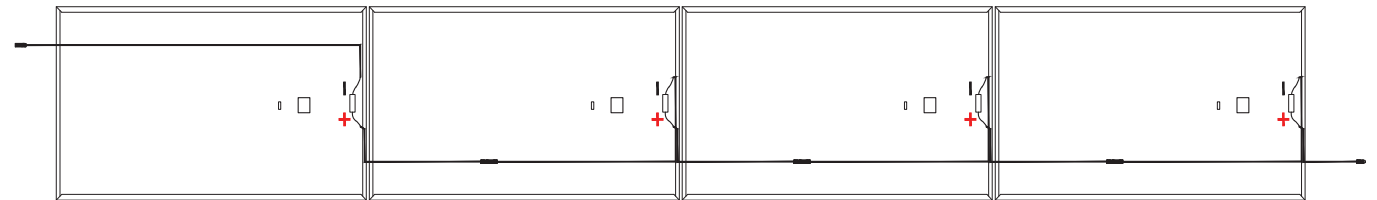
Portrait Stringing



Leapfrog Stringing (Portrait)



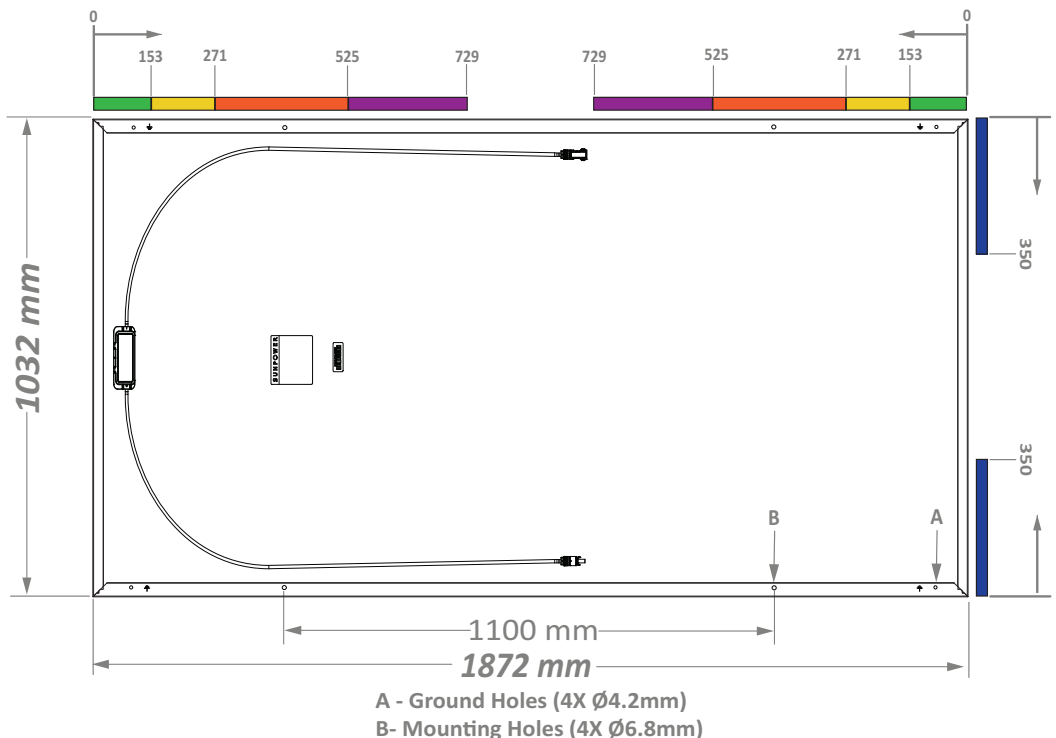
Landscape Stringing



***The image above is for illustration purposes only**

Appendix: Mounting Configurations and Load Ratings

Maxeon 6 66 cells Residential Solar Panel (SPR-MAX6-XXX)

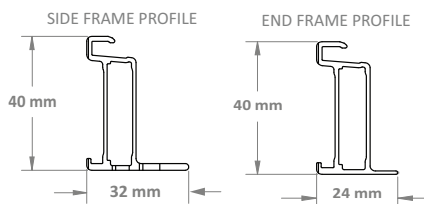


TOP CLAMPS

Measurement Tolerances are +/-3 mm for the Length and Width of the Module.

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Zone Locations (distance from corner in mm)	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame ⁴			0 - 153	+2400/-2400	+1600/-1600
			153 - 271	+2400/-2550	+1600/-1700
			271 - 525	+5400/-4050	+3600/-2700
			525 - 729	+2400/-2550	+1600/-1700
Long Side Mounting, Point Supported ⁵			0 - 153	+2400/-2400	+1600/-1600
			153 - 271	+2400/-2400	+1600/-1600
			271 - 525	+5400/-3600	+3600/-2400
			525 - 729	+2400/-2400	+1600/-1600
Long Side Mounting, Rails Parallel to Mounting Frame (End Mount) ⁶			0 - 153	+2400/-2400	+1600/-1600
			153 - 271	+2400/-2400	+1600/-1600
			271 - 525	+5400/-3600	+3600/-2400
			525 - 729	+2400/-2400	+1600/-1600
Short Side Mounting, Rails Perpendicular to Mounting Frame (End Mount) ⁴			0 - 350	+3600/-2400	+2400/-1600
Short Side Mounting, Point Supported (End Mount)			0 - 350	+2400/-2400	+1600/-1600
Short Side Mounting, Rails Parallel to Mounting Frame (End Mount)			0 - 350	+2400/-2400	+1600/-1600

GEN 5.2 FRAME PROFILE



BOLTS

Mounting Configuration Description ¹	Mounting Configuration Diagram		Mounting Holes Location	Test Load ² Downward/Upward (Pa)	Design Load ³ Downward/Upward (Pa)
	Front View	Back View			
Long Side Mounting, Rails Perpendicular to Mounting Frame			1100mm Holes	+5400/-6000	+3600/-4000
Long Side Mounting, Point Supported			1100mm Holes	+5400/-5400	+3600/-3600

1 In the cases where hybrid mounting is necessary (combination of long and short side mounting), the lowest design load values should be considered as allowable design load.
2 Test loads are for information purposes only, design loads should be considered for the project design.
3 Design Load considers 1.5 Factor of Safety, Test load = Design load x 1.5. Product Warranty covers only design load values. The design loads listed in this table supersede all other loads that may be defined by other parties, unless there is a formal authorization by Maxeon.

4 Rails must not be under the junction box.
5 Bottom flange mounting.
6 Range indicates the positioning of the the clamps not the rails.