

**CLICKFIT<sup>®</sup>**

# COMPLETE RAIL-BASED RACKING SYSTEM

# INSTALLATION GUIDE

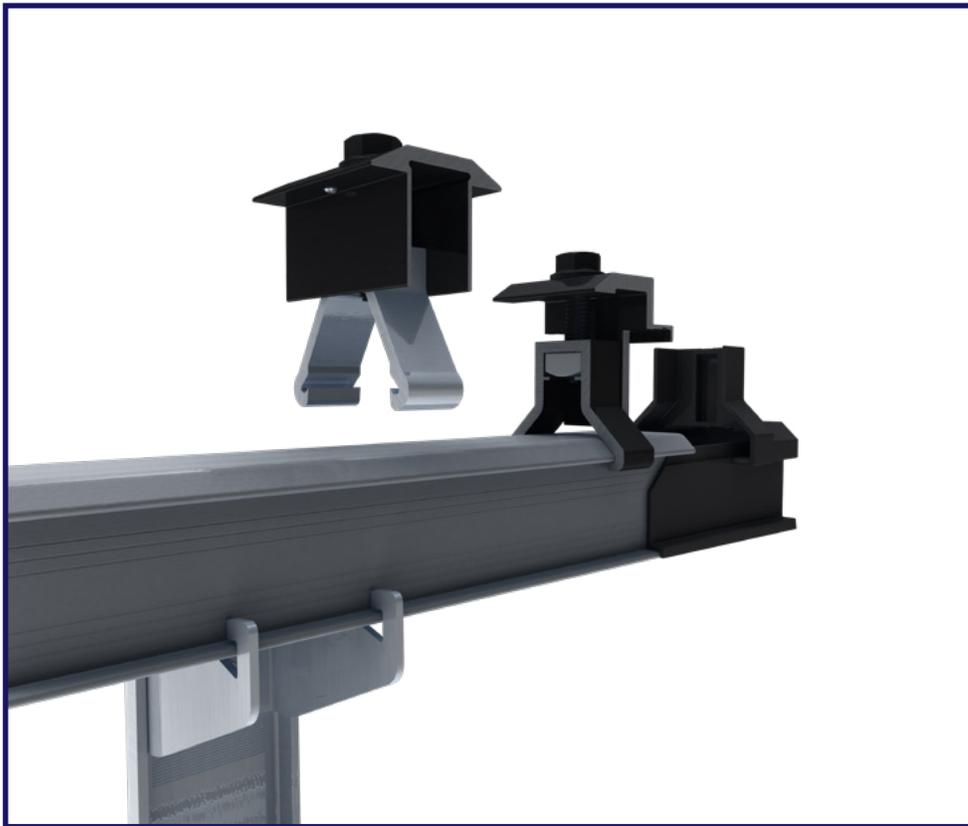
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*Clicking the page name will take you to that page*

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## CLICKFIT

ClickFit conforms to UL 2703 and is one of the fastest installing rail-based systems in the industry. Thanks to its Click-In Rail assembly, the rails can be connected to any of EcoFasten's composition shingle, tile, and metal roof mounts in seconds without the need for fasteners or tools. The ClickFit system is made of robust materials, such as aluminum and coated steel, to ensure corrosion resistance and longevity. ClickFit has been tested in extreme weather conditions including wind, fire, and snow.

## FEATURES

- Tool and fastener free rail attachment
- Fully integrated bonding
- Click-on Mid & End Clamps
- Compatible with a variety of EcoFasten roof attachments



## INTRODUCTION

This manual describes the installation of the ClickFit mounting system for photovoltaic modules on steep-slope roofs. Described within are details for composition shingle and tile, attachments for ClickFit System. Other roof types as well as all other installation manuals can be found for download at [www.EcoFastenSolar.com](http://www.EcoFastenSolar.com).

## GENERAL INSTALLATION CONDITIONS

Failure to observe the requirements in this document can lead to the exclusion of all guarantees and product liability. EcoFasten Solar reserves the right to amend this document without prior notice.

## STABILITY AND CONDITION OF THE ROOF

The roof must be in good condition and strong enough to support the weight of the modules, including the additional equipment, wind and snow loads. When in doubt, consult with the engineer of record, and/or the local building inspector.

## APPLICATION RANGE OF CLICKFIT

Refer to Compatibility module list at the end of this document. Please refer to the Ecofasten ClickFit span tables for system structural certification and allowable spans.

## WARRANTY

Guarantee according to the warranty conditions and general terms and conditions of EcoFasten Solar. These conditions can be found on the website at [www.EcoFastenSolar.com](http://www.EcoFastenSolar.com).

## LIABILITY

EcoFasten Solar cannot accept any liability whatsoever for damage or injury caused by not taking adequate safety precautions or (accurately) following the instructions given, or resulting from negligence during the installation of the product and any corresponding accessories specified in this document.



## OVERVIEW

The ClickFit mounting system consists of patented adjustable tile hooks and L feet, rails, and the installation materials required for the mounting of photovoltaic modules on composition shingle or tile roofs. For simplicity, tile hooks and L feet will be referred to as “attachments”.

## ATTACHING TO THE ROOF

The attachments are fastened to the rafters. Attachments are height-adjustable to level the system on uneven roof surfaces.

## ATTACHING THE RAIL

The rail assembles to the attachments with a click-connector, or Clicker. The rail simply clicks into place without the use of any tools.

## ATTACHING THE MODULES

The modules are attached to the rails by means of mid clamps and end clamps.

Installer must review module and any 3rd party manufacturer’s documentation for compatibility and compliance with warranty terms and conditions.

## SYSTEM COMPONENTS REQUIRED



**CLICKFIT RAIL**



**RAIL SPLICE**



**TILE HOOK**



**L-FOOT**



**END CAP**

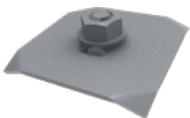


**MID CLAMP**



**END CLAMP**

## SYSTEM COMPONENTS ACCESSORIES



**FRAME MLPE MOUNT**



**MODULE JUMPER**



**MLPE MOUNT**

COMPONENTS

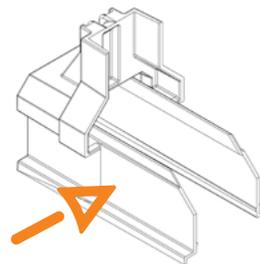


## RATINGS

Fire Rating*	Class A System Fire Rating
Max System Voltage	1500 VDC
Max Fuse Rating	40A
Certification	Conforms to UL STD 2703
Warranty	25 Year Material and Workmanship
UL 2703 Markings	Product listing label is located on the rail end-caps
Roof Pitch	2:12 – 12:12
UL 2703 Allowable Design Load Rating	10 psf downward, 5 psf upward, and 5 psf lateral
Max Module Size	25.6 sqft
Module Orientation	Portrait or Landscape
Multiple use Rated Components (Position Independent)	Mid Clamp, Frame MLPE Mount and MLPE Mount

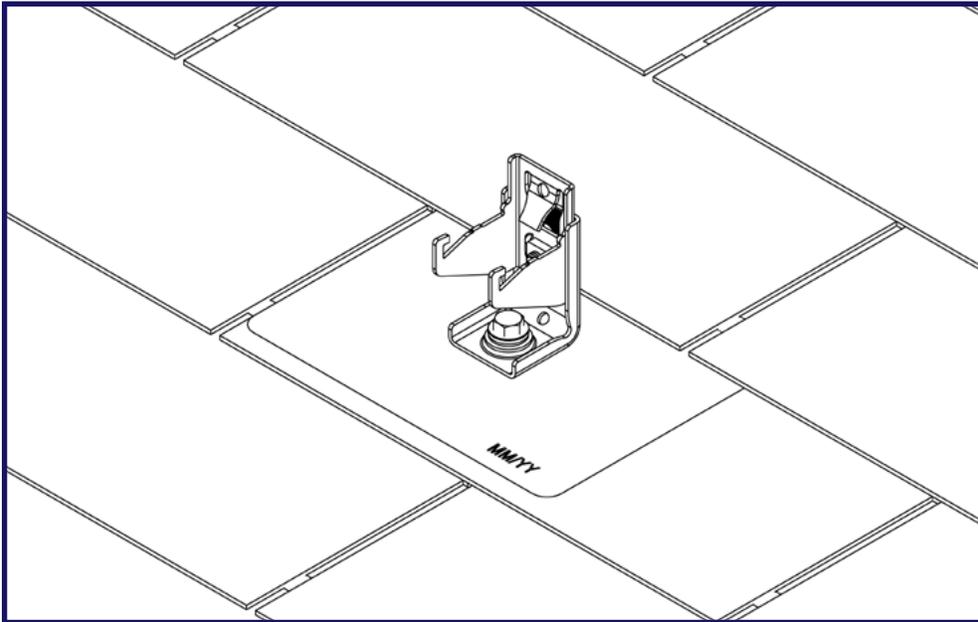
\*Class A System fire rating with Type 1 & 2 PV modules. Any module-to-roof gap is permitted, with no skirt required. This rating is applicable with any roof attachment.

### UL 2703 MARKING EXAMPLE:

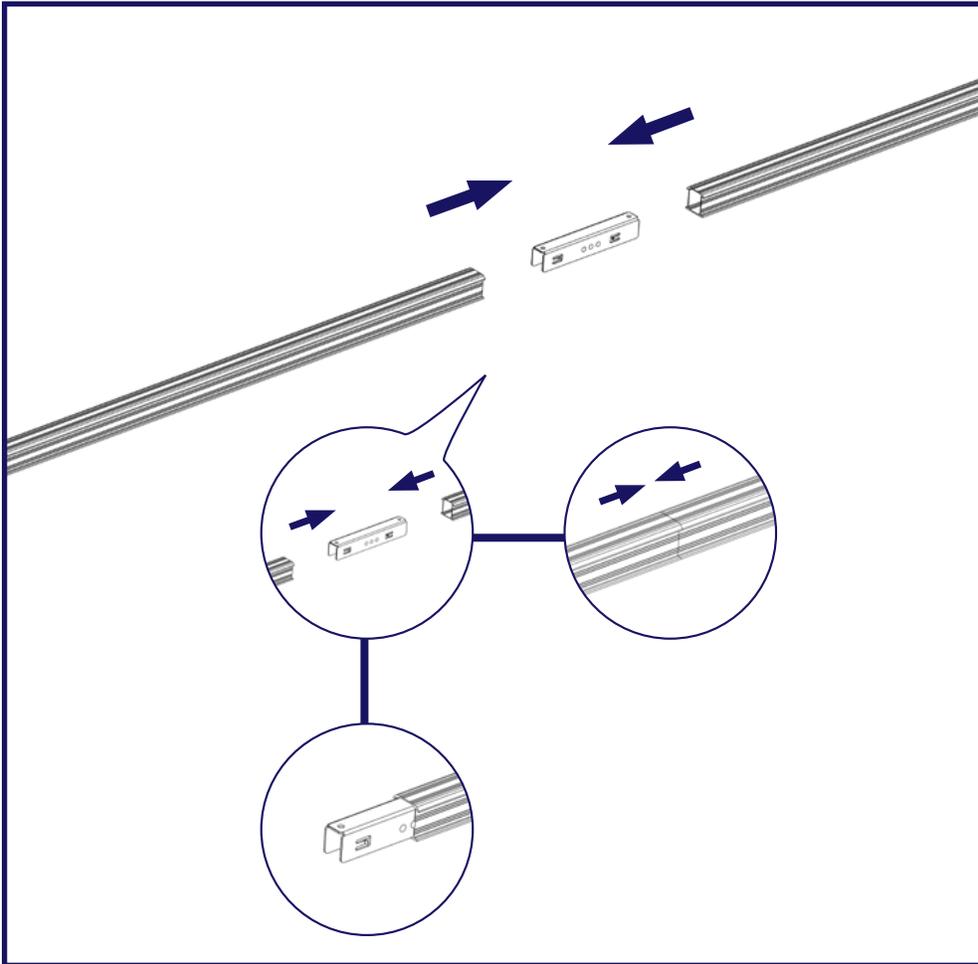


### TORQUE SPECIFICATIONS

Component	Torque (in-lb)	Notes
Lag Screw	N/A	Fully Seat. Use visual indicator of the black EPDM ring around the bonded washer for torquing.
Mid-Clamp	144	
End-Clamp	96	
Rail Clicker Leveling Bolt	142	Pre-torqued upon delivery. Applies to Tile Hook and L-Footer/Clicker
Hook Height Bolt	N/A	Lightly clamp hook to flush with top of next tile row
Ground Lug	N/A	Refer to specific ground lug manufacturer's installation manual
MLPE Clip	144	
MLPE Mount	144	



- Refer to span tables, local jurisdiction, or engineer of record specifications when determining setbacks from roof edges, attachment spans, etc.
- Mark the perimeter and corners of the array on the roof surface.  
**\*Add 3/4" to account for the gap between modules in each direction\***
- Draw or snap chalk lines where the rails will be installed,(refer to module manufacturer specs to determine allowable mounting locations).
- Locate rafters within the area of the array. It may be necessary to shift the array East or West on the roof in order to fall within the rail cantilever specs (1/ 3 of span).
- Stagger rafters every row if required by the local jurisdiction, engineer of record, or company policy.

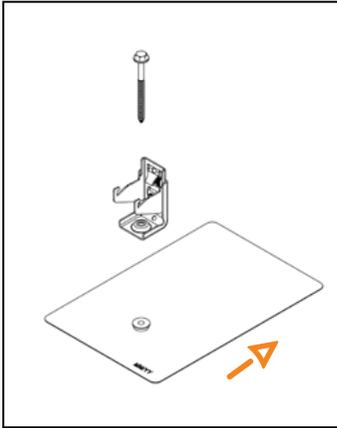


## PRE-INSTALLING RAIL SPLICES

1. Determine the number of rails required per row of modules.
2. Insert a rail splice into one rail. **Do not push it past the center bump.**
3. Slide the next rail onto the rail splice until the two rail ends meet.
4. Repeat steps 2 and 3 until the desired length is achieved. **This is usually easiest to do from the ground.**



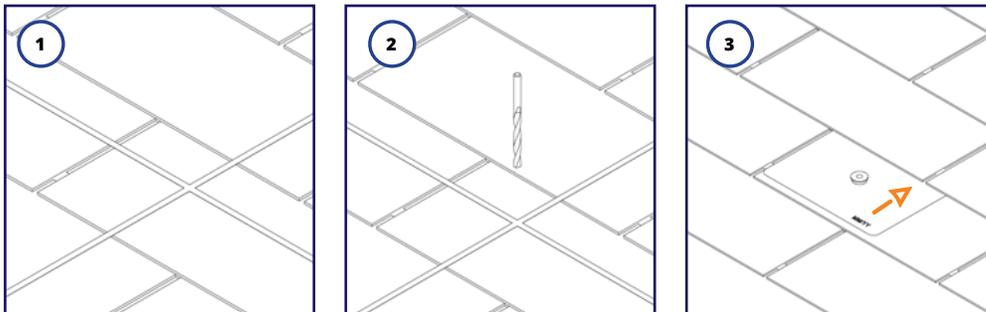
## INSTALLATION OF FLASHING & L-FOOT



- ClickFit for comp shingle roofs uses EcoFasten GF-1 watertight flashing system.
- Other roof types may use different EcoFasten Solar attachments, visit [ecofastensolar.com](http://ecofastensolar.com) to learn about other applications.

\*Note the orientation of the L foot and Clicker. The two Clicker "arms" should be facing downslope\*

### INSTALLATION STEPS:

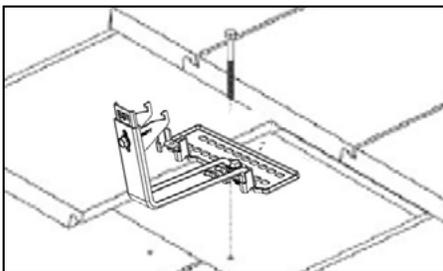


1. Locate rafter lines.
2. Drill 1/4" pilot holes at all attachment points and back fill using roof-compatible sealant.
3. Separate shingles where flashing is to be installed. Insert the flashing so the top portion is under the next row of shingles North. Ensure the flashing is pushed to the third-course of shingle to prevent water infiltration through the vertical joints between shingles.
4. Align GF-1 flashing hole with pilot hole. Insert the lag bolt with pre-installed bonded washer through the L foot and EPDM grommet. Tighten the lag bolt until fully seated. The EPDM Ring visual indicator is the most effective way to ensure a watertight seal.

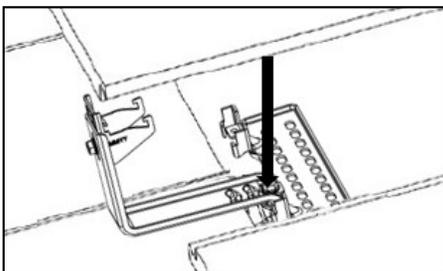
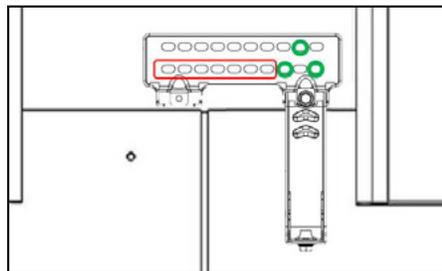


## INSTALLING TILE HOOKS

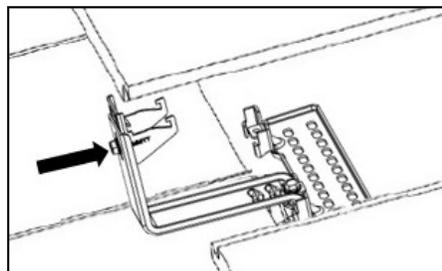
1. Locate rafters on the roof, mark the tiles to be removed. Hint: In some cases rafter tails are visible at the eaves of the roof, making it easy to find the rough location of the rafters. In other cases, the fascia board may have nail heads visible where it was attached to the rafters. In the worst-case a row of tiles may need to be moved to determine the rafter locations.
2. Slide the tile at the desired location upward to expose the roof sub surface. If the tile is to be notched, or if using a replacement flashing, remove it entirely. Clean the sub surface with a brush to remove any debris that could affect the sealing.
3. Locate the rafter center and mark it.
4. Place the tile hook with the hook itself in the valley of the next tile below. Drill one 1/4" pilot hole in the rafter center, taking care to keep the hook in the valley of the tile below. Backfill this hole with a roof-compatible sealant. For flat tiles, try to avoid having the hook land directly under a joint between tiles, this will create a larger gap or more notching than necessary.
5. Install one 5/16" x 4" lag screw on the row of holes closest to the tile hook arm. If possible, install the screw in one of the three holes directly next to the arm. If the lag screw must be installed in one of the seven holes furthest from the arm (denoted by the red rectangle below), install three deck screws in the pattern shown by the green circles below.
6. Adjust the height of the tile hook as necessary using the bolt shown in the fourth image.
7. Flash the surrounding area and lag screw head with roof-compatible sealant as necessary. Refer to Tile Hook Subflashing Installation guide on the next page.
8. Replace the tile that was moved and/or removed, or install the tile replacement flashing. If it is to be notched, mark the tile for notching. Notching can be done with a grinding wheel or by using a chisel.



5.



6.



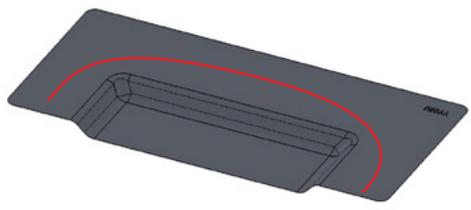
# TILE HOOK SUB-FLASHING INSTALLATION

### TOOLS REQUIRED:

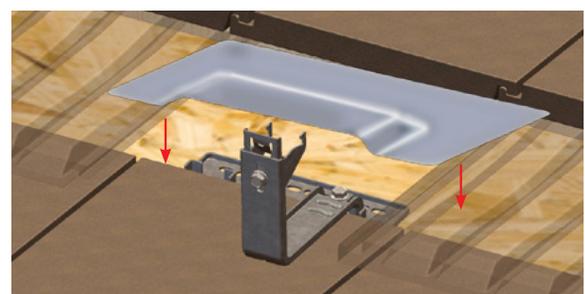
Caulking gun, roofing mastic applicator

### MATERIALS REQUIRED:

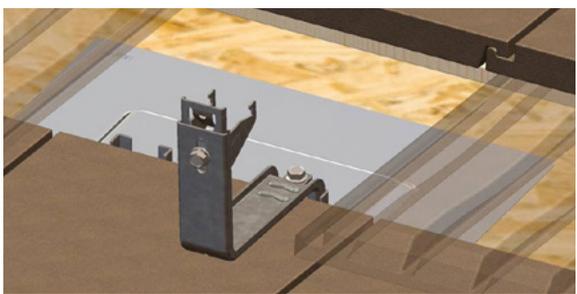
Roofing mastic, reinforcing fabric, roof sealant



Apply a continuous line of the roofing manufacturer's approved sealant on the underside of the ClickFit tile hook sub-flashing to form a U-shape around the raised edges.



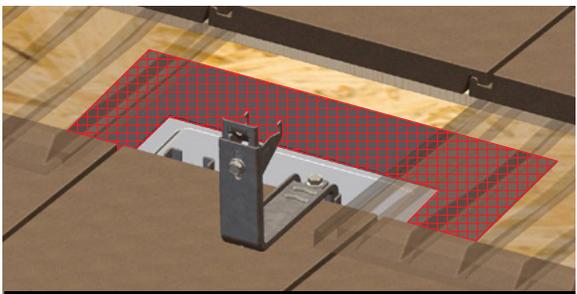
Lower the sub-flashing over the tile hook base. It may be necessary to move adjacent tiles to easily lower the sub-flashing onto the roof deck.



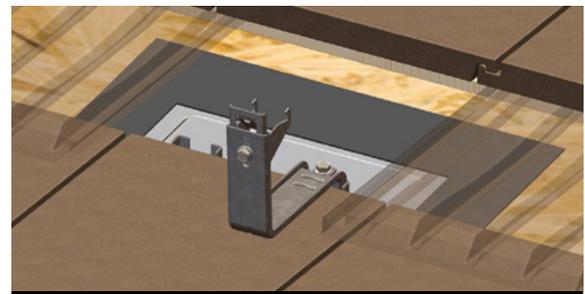
Place the sub-flashing over the base of the tile hook so the flashing covers the entire base.



EcoFasten recommends following the TRI guidelines three-course sealing method. Start the three-course sealing method by applying a layer of roofing mastic over the edges of the tile hook sub-flashing.



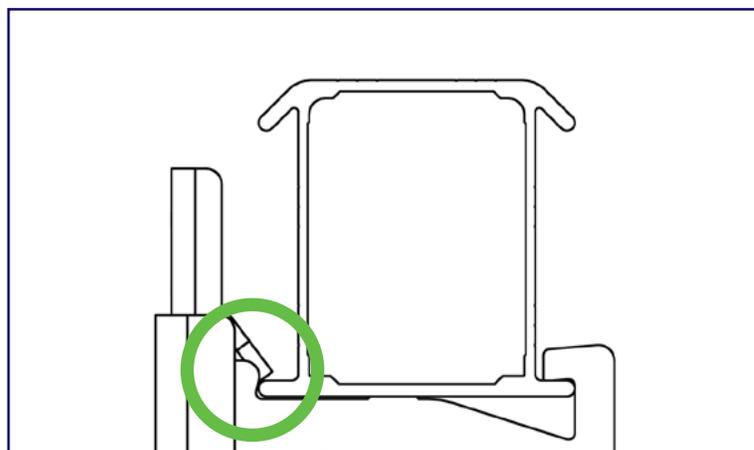
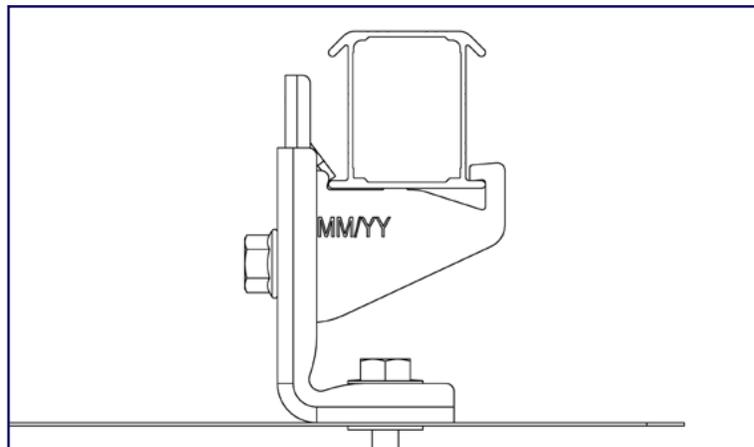
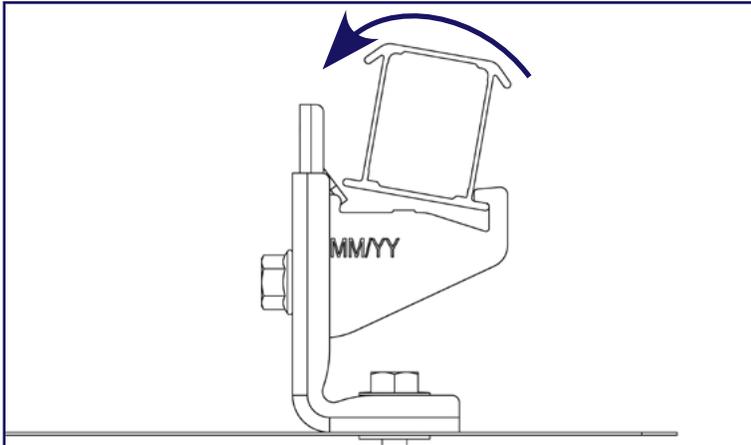
Place strips of reinforcing fabric over mastic to cover approximately 2" from the edge of the sub-flashing in both directions. Place strips on the side first, then the top edge.



Apply a final layer of mastic to completely cover the reinforcing fabric. The flashing is now installed and sealed.



## INSTALLING THE RAIL



1. Place the rail in the Clickers.
2. Ensure the rails extend a minimum of 2" past the last attachments in each row and that each rail is aligned with the next row North and/or South.
3. Roll the rail into each Clicker, an audible "click" should be heard. If attachments are extremely misaligned it may be necessary to loosen the leveling bolt, snap the Clicker onto the rail, then re-tighten the leveling bolt to 142 in-lbs.
4. Level the rail if necessary by loosening the bolt attaching the Clicker to the L foot or tile hook.

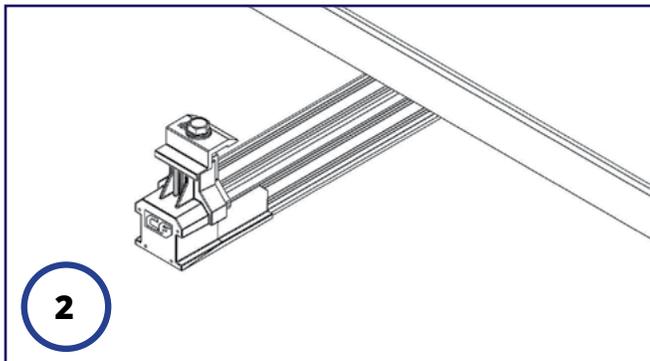
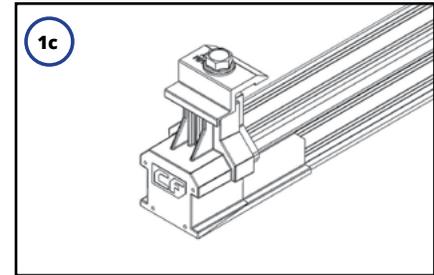
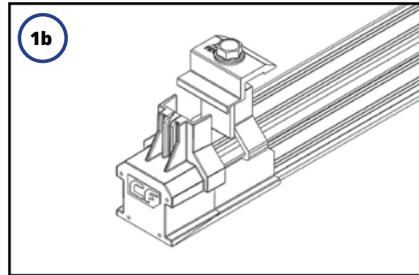
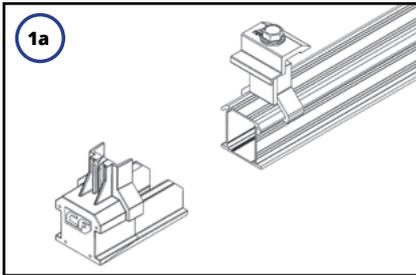
**\*Ensure the tab on the Clicker is aligned with the rail edge as shown to the left.**



## MODULE INSTALLATION

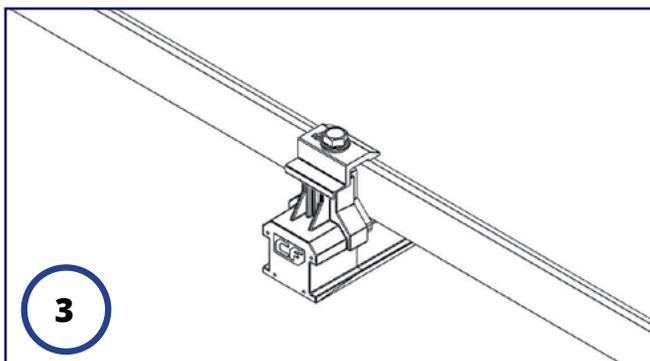
### 1 INSTALL THE END CLAMPS ON EACH RAIL ON WHATEVER END YOU ARE STARTING WITH

- 1a Snap the end clamp onto the rail.
- 1b Slide the end cap onto the rail.
- 1c Turn the leg of the end clamp around the cap.



### 2 PLACE MODULE

Place the module on the rail, ensuring the module junction box is up-slope.\*

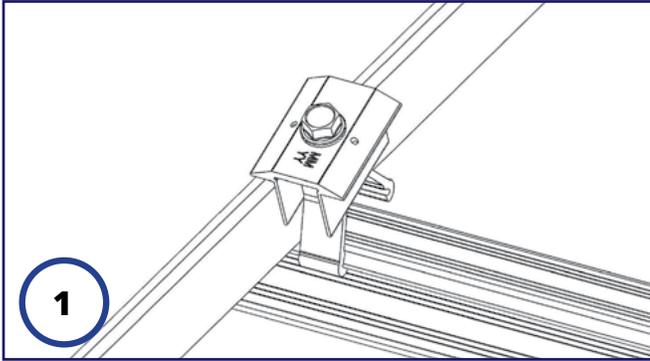


### 3 ALIGN AND TIGHTEN

Slide the module to the end clamp and align it with the array corners. Tighten the end clamp to 96 in-lb

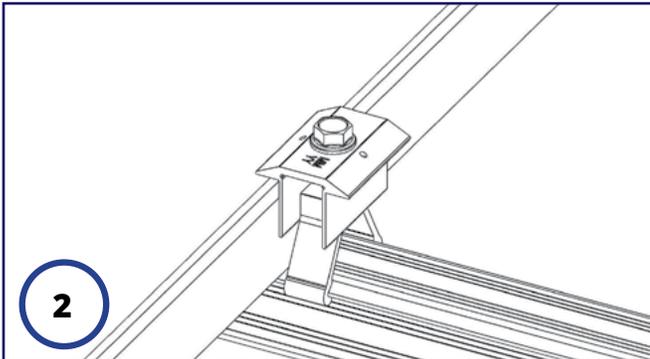


## INSTALLING ADDITIONAL MODULES



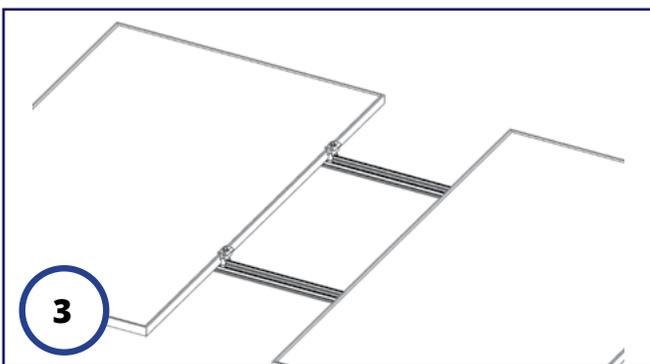
### 1 **CLICK IT ON**

Click a mid clamp onto each rail.



### 2 **SLIDE IT UP**

Slide the mid clamps until they are flush with the side of the existing module.



### 3 **PLACE AND TIGHTEN**

Place and slide the next module firmly against the mid clamps. Align the bottom edges of the modules. Tighten mid clamps to 144 in-lb.



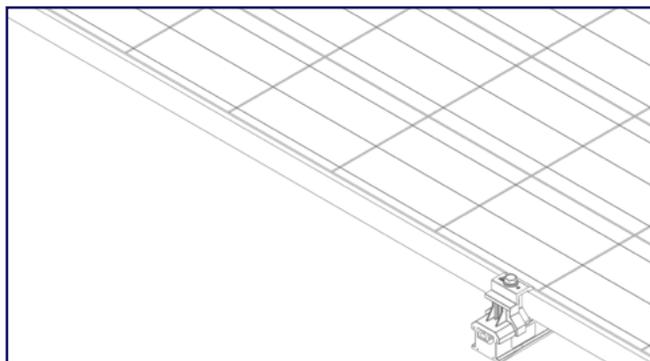
## INSTALLING END CLAMPS AT THE END OF A ROW

1. Install the last mid clamps in the row.
2. Measure the rails from the last mid clamp to the module width plus 1".
3. Cut the rails at this mark. There is some adjustment in the end cap/clamp so it does not need to be a perfect cut.
4. Install end clamps and end caps, tighten to 96 in-lb

### ALTERNATIVE METHOD:

1. Install the last module in the row, tighten the mid clamps.
2. Using a circular saw with a metal blade, or carefully with a reciprocating saw, cut the rail approximately 1" past the edge of the last module.
3. Install end clamps and end caps, tighten to 96 in-lb

Replace the tile that was moved and/or removed, or install the tile replacement flashing. If it is to be notched, mark the tile for notching. Notching can be done with a grinding wheel or by using a chisel.





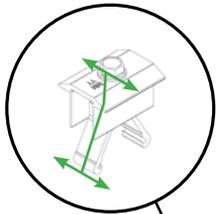
# BONDING AND GROUNDING

## BONDING PATHS

Bonding paths are carried throughout the array in a variety of ways. They are carried module-to-module and module-to-rail through mid clamps, carried at rail-to-rail connections through the bonding jumpers, and carried row-to-row using bonding jumpers either module-to-module on the module frame or rail-to-rail on the ends of the rails.

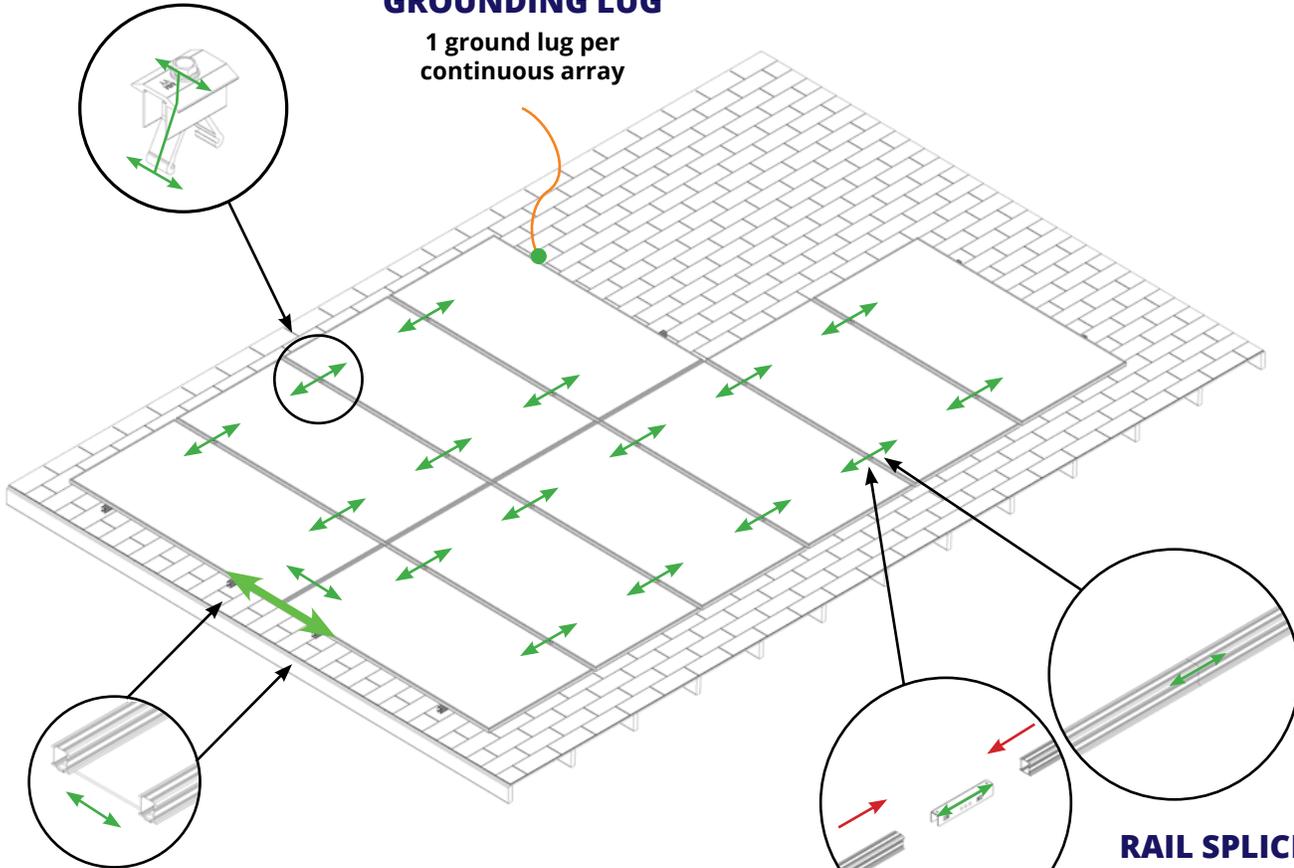
### MID CLAMP

2 mid clamps bonding pairs of modules



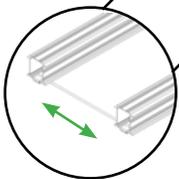
### GROUNDING LUG

1 ground lug per continuous array



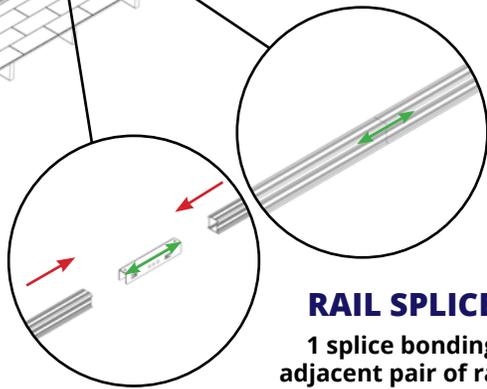
### MODULE JUMPER

1 module jumper bonding module to module and row to row



### RAIL SPLICE

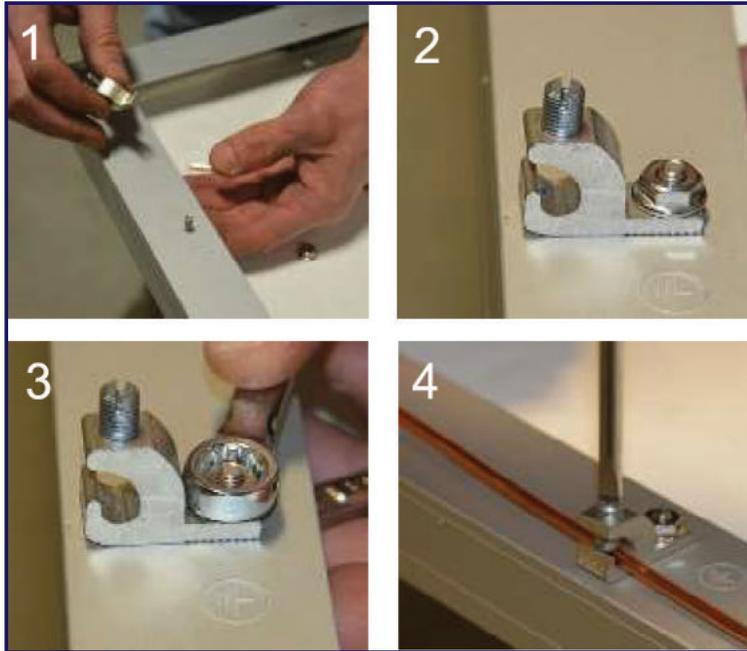
1 splice bonding adjacent pair of rails



GROUNDING



## GROUNDING



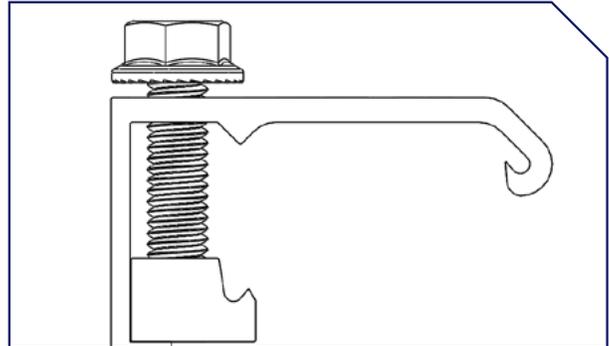
### NECESSARY COMPONENTS

One of the following grounding lugs (or any UL 2703 Compliant ground Lug):

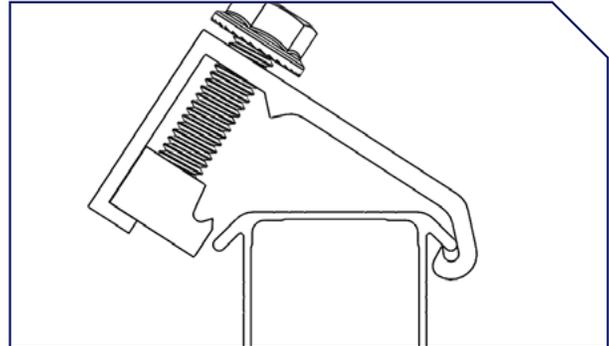
- BurndyCL50-1TN Ground Lug (UL 2703 - E3514343 / UL 467-E9999)
- ILSCO SGB-4 Ground Lug (UL 2703 - E354420 / UL 467 - E34440)
- ILSCO GBL-4DBT (UL 2703 - E354420 / UL467 - E34440)
- ILSCO GBL-4DBTH (UL 2703 - E354420 / UL 467 - E34440)
- ILSCO GBL-4SS (UL 2703 - E354420 / UL 467 - E34440)

\*Equipment grounding wire should be sized in accordance with the National Electrical Code, NFPA70 and a minimum of 1/4" clearance is required between bare copper wires and aluminum components.

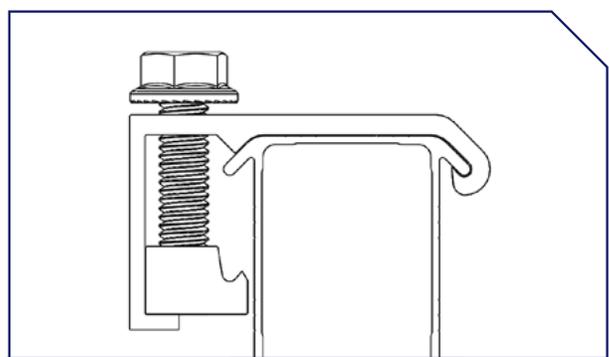
### MLPE MOUNT INTALLATION



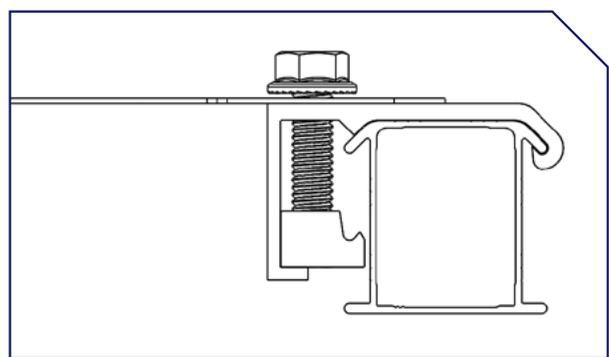
Lower the MLPE Mount to the rail



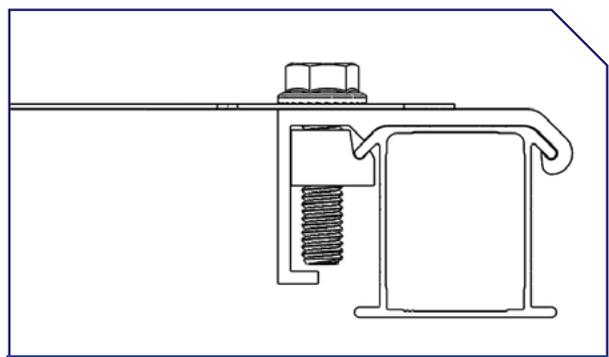
Tilt and hook the mount around the top "dog ear" of the rail



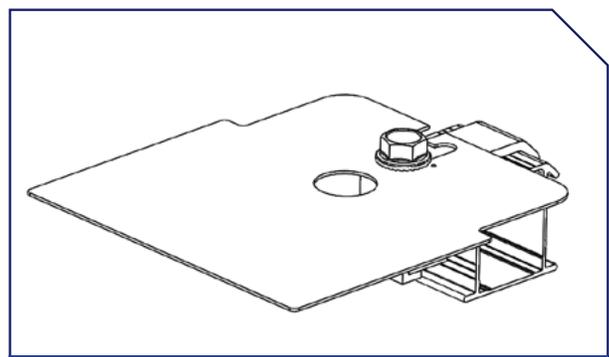
Set the MLPE Mount flush with the top of the rail



Slide the microinverter flange between the MLPE Mount and the serrated bolt flange



Tighten the bolt to 144 in-lbs



Repeat this process for all other microinverter and/or optimizer installations

**MLPE MOUNT IS COMPATIBLE WITH:**

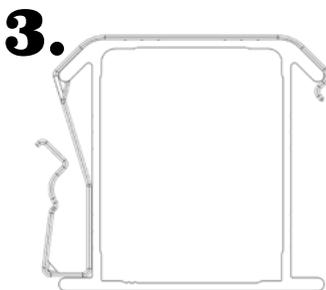
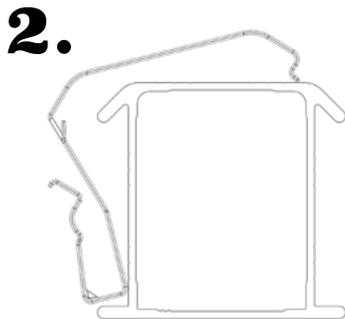
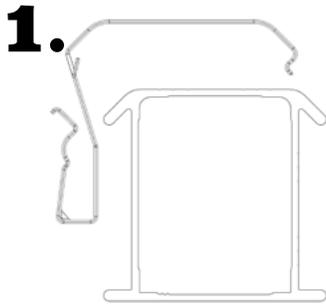
Enphase Products: M250-72, 250-60, M215-60, C250-72, S230, S280, IQ 6, IQ 6+, IQ, IQ7, IQ 7A, IQ 7+, IQ7 PD, IQ 7X, Q Aggregator

SolarEdge Products: M1600, P300, P320, P340, P370, P400, P401, P405, P485, P505, P600, P700, P730, P800p, P800s, P801, P850, P860, P950, P960, P1100

GROUNDING



## WIRE CLIP INSTALLATION



With the ClickFit Rail in place and the Wire Clip in hand, place the wire end on either side of the rail. With the wire end touching the bottom lip of the rail, roll and click-in the Wire Clip to the opposite end of the rail. You will hear an audible click when the Wire Clip is set in place.



## FRAME MLPE MOUNT



### INSTALLING THE FRAME MLPE MOUNT ACCESSORY:

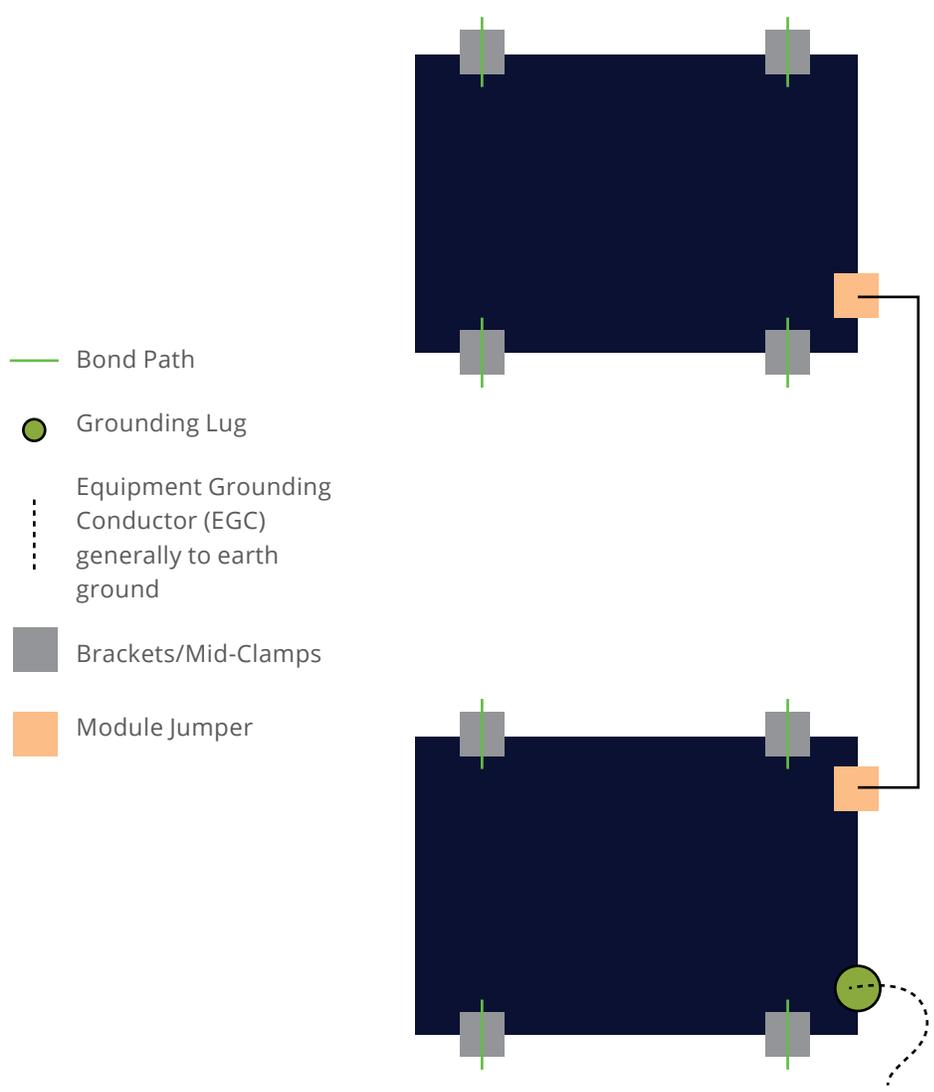
- Install the Frame MLPE Mount
- Slide the Frame MLPE Mount onto the lip of the micro-inverter/power optimizer.
- Slide the micro-inverter/power optimizer into the opposite lip of the module frame.
- Tighten the bolt to 144 in-lb to clamp the Frame MLPE Mount to the module frame and the micro-inverter/power optimizer to the Frame MLPE Mount.
- Ensure that the lip on the clip is tight against the frame and that the micro-inverter/power optimizer flange is tight against the clip flange to avoid rotation during tightening.

### FRAME MLPE MOUNT IS COMPATIBLE WITH:

- **ENPHASE:** M250-72, 250-60, M215-60, C250-72, S230, S280, IQ 6, IQ 6+, IQ, IQ7, IQ 7A, IQ 7+, IQ7 PD, IQ 7X, Q Aggregator
- **SOLAREEDGE:** M1600, P300, P320, P340, P370, P400, P401, P405, P485, P505, P600, P700, P730, P800p, P800s, P801, P850, P860, P950, P960, P1100
- **SEE PAGE 22 FOR COMPATIBLE MODULE LIST**

## MODULE MAINTENANCE AND SERVICING

During servicing or maintenance, module removal may disrupt the bonding path and could introduce the risk of electric shock. If module removal is required for servicing, then a Module Jumper shall be installed to the adjacent modules to maintain the bond path. Modules should only be removed by qualified persons in compliance with the instructions in this manual.



# ACCESSORIES



## UL 2703 CERTIFIED MODULES

This racking system may be used to ground and/or mount a PV module complying with UL 1703 or UL 61730 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.

Unless otherwise noted, "xxx" refers to the module power rating and both black and silver frames are included in the certification. " "

MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>Adani</b>	Adani modules with 35 and 40mm frames ASX-Y-ZZ-xxx Where "X" can be B, M or P, "Y" can be 6 or 7, and "ZZ" can be blank, PERC, B-PERC, or AB-PERC
<b>Amerisolar</b>	Amerisolar modules with 35, 40 and 50 mm frames AS-bYxxxZ Where "b" can be 5 or 6; "Y" can be M, P, M27, P27, M30, or P30; and "Z" can be blank, W or WB
<b>Aptos Solar</b>	Aptos modules with 35 and 40 mm frames DNA-yy-zzaa-xxx Where "yy" can be 120 or 144; "zz" can be MF or BF; and "aa" can be 23 or 26
<b>Astronergy Solar</b>	Astronergy modules with 30, 35, 40, and 45 mm frames aaSMbbyC/zz-xxx Where "aa" can be CH or A; "bb" can be 60, 66, or 72; "yy" can be blank, 10 or 12; "C" can be M, P, M(BL), M-HC, M(BL)-HC, P-HC, M(DG), or M(DGT); and "zz" can be blank, HV, F-B, or F-BH
<b>ASUN</b>	ASUN modules with 35 and 40 mm frames ASUN-xxx-YYZZ-aa Where "YY" can be 60 or 72; "ZZ" can be M, or MH5; and "aa" can be blank or BB
<b>Auxin</b>	Auxin modules with 40 mm frames AXN6y6zAxxx Where "y" can be M or P; "z" can be 08, 09, 10, 11, or 12; and "A" can be F or T
<b>Axitec</b>	Axitec Modules with 35 and 40 mm frames AC-xxxY/aaZZb Where "Y" can be M, P or MH; "aa" can be blank, 125- or 156-; "ZZ" can be 54, 60, 72, 120, or 144; "b" can be S, X, V, VB, XV, or MX



MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>Boviet</b>	Boviet modules with 35 and 40mm frames BVM66aaYY-xxxBcc Where "aa" can be 9, 10 or 12; "YY" is M, or P; and "B" can be blank, L or S; and "cc" can be blank, H, H-BF, H-HC, HC-BF or H-HC-BF
<b>BYD</b>	BYD modules with 35 mm frames BYDxxxAY-ZZ Where "A" can be M6, P6, MH or PH; "Y" can be C or K; and "ZZ" can be 30 or 36
<b>Canadian Solar</b>	Canadian Solar modules with 30, 35 and 40 mm frames CSbY-xxxZ Where "b" can be 1, 3 or 6; "Y" can be H, K, L, N, P, U, V, W, X or Y; and "Z" can be M, P, MS, PX, M-SD, P-AG, P-SD, MB-AG, PB-AG, MS-AG, or MS-SD
<b>CertainTeed</b>	CertainTeed modules with 35 and 40mm frames CTxxxYZZ-AA Where "Y" can be M, P, or HC; "ZZ" can be 00, 01, 10, or 11; and "AA" can be 01, 02, 03, 04 or 06
<b>CSUN</b>	Csun modules with 35 and 40 mm frames YYxxx-zzAbb Where "YY" is CSUN or SST; "zz" is blank, 60, or 72; and "A" is blank, P or M or MM; "bb" is blank, BB, 5BB, BW, or ROOF
<b>Dehui</b>	Dehui modules with 35 and 40mm frames DH-MYYYZ-xxx Where "YYY" can be 760, 772, 860, 872; and "Z" can be B or W
<b>Ecosolargy</b>	Ecosolargy modules with 35, 40, and 50 mm frames ECOxxxYzza-bbD Where "Y" can be A, H, S, or T; "zz" can be 125 or 156; "A" can be M or P; "bb" can be 60 or 72; and "D" can be blank or B
<b>ET Solar</b>	ET Solar modules with 35, 40, and 50 mm frames ET-YZZZxxxAA Where "Y" can be P, L, or M; "ZZZ" can be 660, 660BH, 672, 672BH, 754BH or 766BH; and "AA" can be TB, TW, WB, WW, BB, WBG, WWG, WBAC, WBCO, WWCO, WWBCO or BBAC
<b>Flex</b>	Flex modules with 35, 40, and 50 mm frames FXS-xxxYY-ZZ; Where "YY" can be BB or BC; and "ZZ" can be MAA1B, MAA1W, MAB1W, SAA1B, SAA1W, SAC1B, SAC1W, SAD1W, SBA1B, SBA1W, SBC1B, or SBC1W



MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>GCL</b>	GCL modules with 35 mm and 40 mm frames GCL-ab/YY xxx Where “a” can be M or P; “b” can be 3 or 6; and “YY” can be 60, 72, 72H, or 72DH
<b>GigaWatt Solar</b>	Gigawatt modules with 40 mm frames GWxxxYY Where “YY” can be either PB or MB
<b>Hansol</b>	Hansol modules with 35 and 40 frames HSxxxYY-zz Where “YY” can be PB, PD, PE, TB, TD, UB, UD, or UE; and “zz” can be AH2, AN1, AN3, AN4, HH2, HV1, or JH2
<b>Hanwha Solar</b>	Hanwha Solar modules with 40, 45, and 50 mm frames HSLaaP6-YY-1-xxxZ Where “aa” can be either 60 or 72; “YY” can be PA or PB; and “Z” can be blank or B
<b>Hanwha Q CELLS</b>	Hanwha Q CELLS Modules with 32, 35, 40, and 42mm frames aaYY-ZZ-xxx where “aa” can be Q. or B.; “YY” can be PLUS, PRO, PEAK, LINE PRO, LINE PLUS, PLUS DUO or PEAK DUO; and “ZZ” can be G3, G3.1, G4, G4.1, L-G2, L-G2.3, L-G3, L-G3.1, L-G3y, L-G4, L-G4.2, L-G4y, LG4.2/TAA, BFR-G3, BLK-G3, BFR-G3.1, BLK-G3.1, BFR-G4, BFR-G4.1, BFR G4.3, BLK-G4.1, G4/SC, G4.1/SC, G4.1/TAA, G4.1/MAX, BFR G4.1/TAA, BFR G4.1/MAX, BLK G4.1/TAA, BLK G4.1/SC, EC-G4.4, G5, G5/SC, G5/TS, BLK-G5, BLK-G5/SC, BLK-G5/TS, L-G5, L-G5.1, L-G5.2, L-G5.2/H, L-G5.3, G6, G6/SC, G6/TS, G6+, BLK-G6, L-G6, L-G6.1, L-G6.2, L-G6.3, G7, BLK-G6+, BLK-G6+/AC, BLK-G6+/HL, BLK-G6+/SC, BLK-G6/TS, G6+/TS, BLK-G6+/TS, BLK-G7, G7.2, G8, BLK-G8, G8+, BLK-G8+ L-G7, L-G7.1, L-G7.2, L-G7.3, L-G8, L-G8.1, L-G8.2, L-G8.3, L-G8.3/BFF, ML-G9, BLK ML-G9, ML-G9+, BLK ML-G9+,ML-G10, BLK ML-G10, ML-G10+, BLK ML-G10+, ML-G10.a, BLK ML-G10.a, ML-G10.a+, BLK ML-G10.a+, XL-G9, XL-G9.2, XL-G9.3, XL-G10.2, XL-G10.3, XL-G10.c or XL-G10.d
<b>Heliene</b>	Heliene modules with 40 mm frames YYZZxxxA Where “YY” can be 36, 60, 72, 96, 120 or 144; “ZZ” can be HC, M, P, or MBLK; and “A” can be blank, HomePV, or Bifacial
<b>HT-SAAE</b>	HT-SAAE modules with 35 and 40 mm frames HTyy-aaaZ-xxx Where “yy” can be 60, 66 or 72; “aaa” can be 18, 156 or 166; “Z” can be M, P, M-C, P-C, M(S), M(VS), M(V), P(V), M(V)-C, P(V)-C, or X



MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>Hyundai</b>	Hyundai modules with 33, 35, 40 and 50 mm frames HiY-SxxxZZ Where "Y" can be A, D or S; "S" can be M or S; and "ZZ" can be HG, HI, KI, MI, MF, MG, PI, RI, RG, RG(BF), RG(BK), SG, TI or TG
<b>Itek</b>	Itek Modules with 40 and 50 mm frames IT-xxx-YY Where "YY" can be blank, HE, or SE, or SE72
<b>JA Solar</b>	JA Solar modules with 30, 35, 40 and 45 mm frames JAyyzz-bbww-xxx/aa Where "yy" can be M, P, M6 or P6; "zz" can be blank, (K), (L), (R), (V), (BK), (FA), (TG), (FA)(R), (L)(BK), (L)(TG), (R)(BK), (R)(TG), (V)(BK), (BK)(TG), or (L)(BK)(TG); "bb" can be 48, 60, 66, 72 or 78; "ww" can be D09, S01, S02, S03, S06, S09, S10, S12, S20 or S30; and "aa" can be BP, MR, SI, SC, PR, 3BB, 4BB, 4BB/RE, 5BB
<b>Jinko</b>	Jinko modules with 35 and 40 mm frames JKMYxxxZZ-aa Where "Y" can either be blank or S; "ZZ" can be M, P, or PP; and "aa" can be blank, 60, 60B, 60H, 60L, 60BL, 60HL, 60HB, 60HBL, 6HBL-EP, 60-J4, 60B-J4, 60B-EP, 60(Plus), 60-V, 60-MX, 6RL3, 6RL3-B, 6TL3-B, 7RL3-V, 7RL3-TV, 72, 72B, 72-J4, 72B-J4, 72(Plus), 72-V, 72H-V, 72L-V, 72HL-V, 72-MX, 72H-BDVP, 72HL-TV, or 72HL-V-MX3
<b>Kyocera</b>	Kyocera Modules with 46mm frames KYxxxZZ-AA Where "Y" can be D or U; "ZZ" can be blank, GX, or SX; and "AA" can be LPU, LFU, UPU, LPS, LPB, LFB, LFBS, LFB2, LPB2, 3AC, 3BC, 3FC, 4AC, 4BC, 4FC, 4UC, 5AC, 5BC, 5FC, 5UC, 6BC, 6FC, 8BC, 6MCA, or 6MPA
<b>LG</b>	LG modules with 35, 40, and 46 mm frames LGxxxYaZ-bb Where "Y" can be A, E, M, N, Q, S; "a" can be A, 1, 2 or 3; "Z" can be C, K, T, or W; and "bb" can be A3, A5, A6, B3, B6, E6, G3, G4, J5, K4, L5, N5, V5 or V6
<b>Longi</b>	Longi modules with 30, 35 and 40 mm frames LRa-YYZZ-xxxM Where "a" can be 4 or 6; "YY" can be blank, 60 or 72; and "ZZ" can be blank, BK, BP, HV, PB, PE, PH, HBD, HIB, HIH, HPB, HPH, or HIBD
<b>Mission Solar</b>	Mission Solar modules with 33 and 40 mm frames MSEbbxxxZZaa Where "bb" can be blank or 60A; "ZZ" can be blank, MM, SE, SO, SQ, SR, SX or TS; and "aa" can be blank, 1J, 4J, 4S, 5K, 5R, 5T, 60, 6J, 6S, 6W, 6Z, 8K, 8T, or 9S



MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>Mitsubishi</b>	Mitsubishi modules with 46 mm frames PV-MYYxxxZZ Where "YY" can be LE or JE; and "ZZ" can be either HD, HD2, or FB
<b>Motech</b>	IM and XS series modules with 40, 45, and 50 mm frames
<b>Next Energy Alliance</b>	Next Energy Alliance modules with 35 and 40mm frames yyNEA-xxxZZ where "yy" can be blank or US; "ZZ" can be M, MB or M-60
<b>Neo Solar Power</b>	Neo Solar Power modules with 35 mm frames D6YxxxZZaa Where "Y" can be M or P; "ZZ" can be B3A, B4A, E3A, E4A, H3A, H4A; and "aa" can be blank, (TF), ME or ME (TF)
<b>Panasonic (HIT)</b>	Panasonic modules with 35 and 40 mm frames VBHNxxxYYzzA Where "YY" can be either KA, RA, SA or ZA; "zz" can be either 01, 02, 03, 04, 06, 06B, 11, 11B, 15, 15B, 16, 16B, 17, or 18; and "A" can be blank E, G or N
<b>Panasonic (EverVolt)</b>	Panasonic modules with 30 mm frames EVPVxxxA Where "A" can be blank or K
<b>Peimar</b>	Peimar modules with 40 mm frames SbxxxYzz Where "b" can be G, M or P; "Y" can be M or P; and "zz" can be blank, (BF), or (FB)
<b>Philadelphia Solar</b>	Philadelphia modules with 35 and 40 mm frames PS-YzzAA-xxx Where "Y" can be M or P; "zz" can be 60 or 72; and "AA" can be blank or (BF)
<b>Phono Solar</b>	Phono Solar modules with 35, 40, and 45 mm frames PSxxxY-ZZ/A Where "Y" can be M, M1, MH, M1H, M4, M4H, or P; "ZZ" can be 20 or 24; and "A" can be F, T, U, UH, or TH
<b>Recom</b>	Recom modules with 35 and 40 mm frames RCM-xxx-6yy Where "yy" can be MA, MB, ME or MF
<b>REC Solar</b>	REC modules with 30, 38 and 45 mm frames RECxxxYYZZ Where "YY" can be AA, M, NP, NP2, PE, PE72, TP, TP2, TP2M, TP2SM, TP2S, TP3M or TP4; and "ZZ" can be blank, Black, BLK, BLK2, SLV, 72 or Pure



MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>Renesola</b>	ReneSola modules with 35, 40 and 50 mm frames AAxxxY-ZZ Where "AA" can be SPM(SLP) or JC; "Y" can be blank, F, M or S; and "ZZ" can be blank, Ab, Ab-b, Abh, Abh-b, Abv, Abv-b, Bb, Bb-b, Bbh, Bbh-b, Bbv, Bbv-b, Db, Db-b, or 24/Bb
<b>Renogy</b>	Renogy Modules with 40 and 50 mm frames RNG-xxxY Where "xxx" is the module power rating; and "Y" can be D or P
<b>Risen</b>	Risen Modules with 35 and 40 mm frames RSMyy-6-xxxZZ Where "yy" can be 60, 72, 120, 132 or 144; and "ZZ" can be M or P
<b>S-Energy</b>	S-Energy modules with 35 and 40mm frames SABB-CCYYY-xxxZ Where "A" can be C, L or N; "BB" can be blank, 20, 40 or 45; "CC" can be blank, 60 or 72; "YYY" can be blank, MAE, MAI, MBE, MBI, MCE or MCI; and "Z" can be V, M-10, P-10 or P-15
<b>Seraphim Energy Group</b>	Seraphim modules with 35 and 40 mm frames SEG-aYY-xxxZZ Where "a" can be blank, 6 or B; "YY" can be blank, MA, MB, PA, or PB; and "ZZ" can be blank, BB, BG, BW, HV, WB, WW, BMB, BMA-HV, BMB-HV
<b>Seraphim USA</b>	Seraphim modules with 35, 40 and 50 mm frames SRP-xxx-YYY-ZZ Where "xxx" is the module power rating; and "YYY" can be 6MA, 6MB, 6PA, 6PB, BMD, 6QA-XX-XX, and 6QB-XX-XX; ZZ is blank, BB or HV
<b>Sharp</b>	Sharp modules with 35 and 40 mm frames NUYYxxx Where "YY" can be SA or SC
<b>Silfab</b>	Silfab Modules with 35 and 38 mm frames SYY-Z-xxxAb Where "YY" can be IL, SA, LA, SG or LG; "Z" can be blank, M, P, or X; "A" can be blank, B, H, M, N; and "b" can be A, C, L, G, K, T, U or X
<b>Solaria</b>	Solaria modules with 40 mm frames PowerXT xxxY-ZZ Where "Y" can be R or C; and "ZZ" can be AC, BD, BX, BY, PD, PM, PM-AC, PX, PZ, WX or WZ
<b>Solarcity (Tesla)</b>	Solarcity modules with 40 mm frames SCxxxYY Where "YY" can be blank, B1 or B2

MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>SolarTech</b>	SolarTech modules with 40 and 42 mm frames AAA-xxxYY Where “AAA” can be PERCB-B, PERCB-W, HJT B-B, HJT B-W or STU; “YY” can be blank, PERC or HJT
<b>SolarWorld AG</b>	SolarWorld Sunmodule Plus, Protect, Bisun, XL, Bisun XL, may be followed by mono, poly, duo, black, bk, or clear; modules with 31, 33 or 46 mm frames SW-xxx
<b>SolarWorld Americas</b>	SolarWorld Sunmodule Plus, Protect, Bisun, XL, Bisun XL, may be followed by mono, poly, duo, black, bk, or clear; modules with 33 mm frames SWA-xxx
<b>Sonali</b>	Sonali Modules with 40 mm frames SSxxx
<b>Stion</b>	Stion Thin film modules with 35 mm frames STO-xxx or STO-xxxA
<b>SunEdison</b>	SunEdison Modules with 35, 40 & 50 mm frames SE-YxxxZABCDE Where “Y” can be B, F, H, P, R, or Z; “Z” can be 0 or 4; “A” can be B, C, D, E, H, I, J, K, L, M, or N; “B” can be B or W; “C” can be A or C; “D” can be 3, 7, 8, or 9; and “E” can be 0, 1 or 2
<b>Suniva</b>	Suniva modules with 35, 38, 40, 46, and 50 mm frames OPTxxx-AA-B-YYY-Z MVXxxx-AA-B-YYY-Z Where “AA” is either 60 or 72; “B” is either 4 or 5; “YYY” is either 100,101,700,1B0, or 1B1; and “Z” is blank or B
<b>Sunpower</b>	Sunpower standard (G3 or G4) or InvisiMount (G5) 40 and 46 mm frames SPR-Zb-xxx-YY Where “Z” is either A, E, P or X; “b” can be blank, 17, 18, 19, 20, 21, or 22; and “YY” can be blank, BLK, COM, C-AC, D-AC, E-AC, BLK-E-AC, G-AC, BLK-C-AC, or BLK-D-AC
<b>Sunspark</b>	Sunspark modules with 40 mm frames SYY-xxxZ-A Where “YY” can be MX or ST; and “Z” can be M, MB, M3, M3B, P or W; and “A” can be 60 or 72
<b>Suntech</b>	Suntech Modules with 35, 40 and 50mm frames STPxxxz-yy/aa Where “y” is blank or S; and “z” can be 20, 24, A60 or A72U; and “aa” can be Vd, Vem, Vfw, Vfh, Wdb, Wde, Wd, or Wfhb



MANUFACTURER	LIST OF UL 2703 APPROVED MODULES
<b>Talesun</b>	Talesun modules with 35 and 40mm frames TP6yZZaaxxx-b Where “y” can be blank, F, H, or L; “ZZ” can be 60 or 72; “aa” can be M, M(H), or P; and “b” can be blank, B, T, or (H)
<b>Tesla</b>	Tesla modules with 40 mm frames TxxxY Where “Y” can be H or S
<b>Trina</b>	Trina Modules with 30, 35, 40 and 46mm frames TSM-xxxYYZZ Where “YY” can be DD05, DD06, DD14, DE14, DE06X, DE15, DE15V, DEG15, PA05, PC05, PD05, PD06, PA14, PC14, PD14, PE14, or PE15 ; and “ZZ” can be blank, (II), .05, .05(II), .08, .10, .18, .08D, .18D, 0.82, .002, .00S, 05S, 08S, A, A.05, A.08, A.10, A.18, A(II), A.05(II), A.08(II), A.082(II), A.10(II), A.18(II), H, H(II), H.05(II), H.08(II), HC.20(II), HC.20(II), M, M(II), M.05(II), MC.20(II)
<b>URE</b>	URE modules with 35 mm frames DyZxxxxaa Where “D” can be D or F, “y” can be A, 6 or 7; “Z” can be K or M; and “aa” can be H3A, H4A, H8A, E7G-BB, E8G or E8G-BB
<b>Vikram</b>	Vikram solar modules with 40 mm frames VSyy.ZZ.AAA.bb Where “yy” can be M, P, MBB, MH, MS, MHBB, or PBB; “ZZ” can be 60 or 72; “AAA” is the module power rating; and “bb” can be 03, 04 or 05
<b>VSUN</b>	VSUN modules with 35 and 40 mm frames VSUNxxx-YYz-aa Where “YY” can be 60, 72, 120, or 144; “z” can be M, P, MH, PH, or BMH; and “aa” can be blank, BB, or BW
<b>Waaree</b>	Waaree modules with 40mm frames WSyy-xxx where “yy” can be blank or M
<b>Winaico</b>	Winaico modules with 35 and 40 mm frames Wsy-xxxZa Where “y” can be either P or T; “Z” can be either M, P, or MX; and “a” can be blank or 6
<b>Yingli</b>	Yingli modules with 35 and 40 mm frames YLxxxZ-yy Where “Z” can be D or P; “yy” can be 29b, 30b, 34d, 35b, 36b or 40d
<b>ZN Shine</b>	ZN Shine modules with 35mm frames ZXMY-AAA-xxx/M Where “Y” can be 6 or 7, “AAA” can be 72, NH120 or NH144



# CLAMP PART NUMBERS

## END CLAMPS

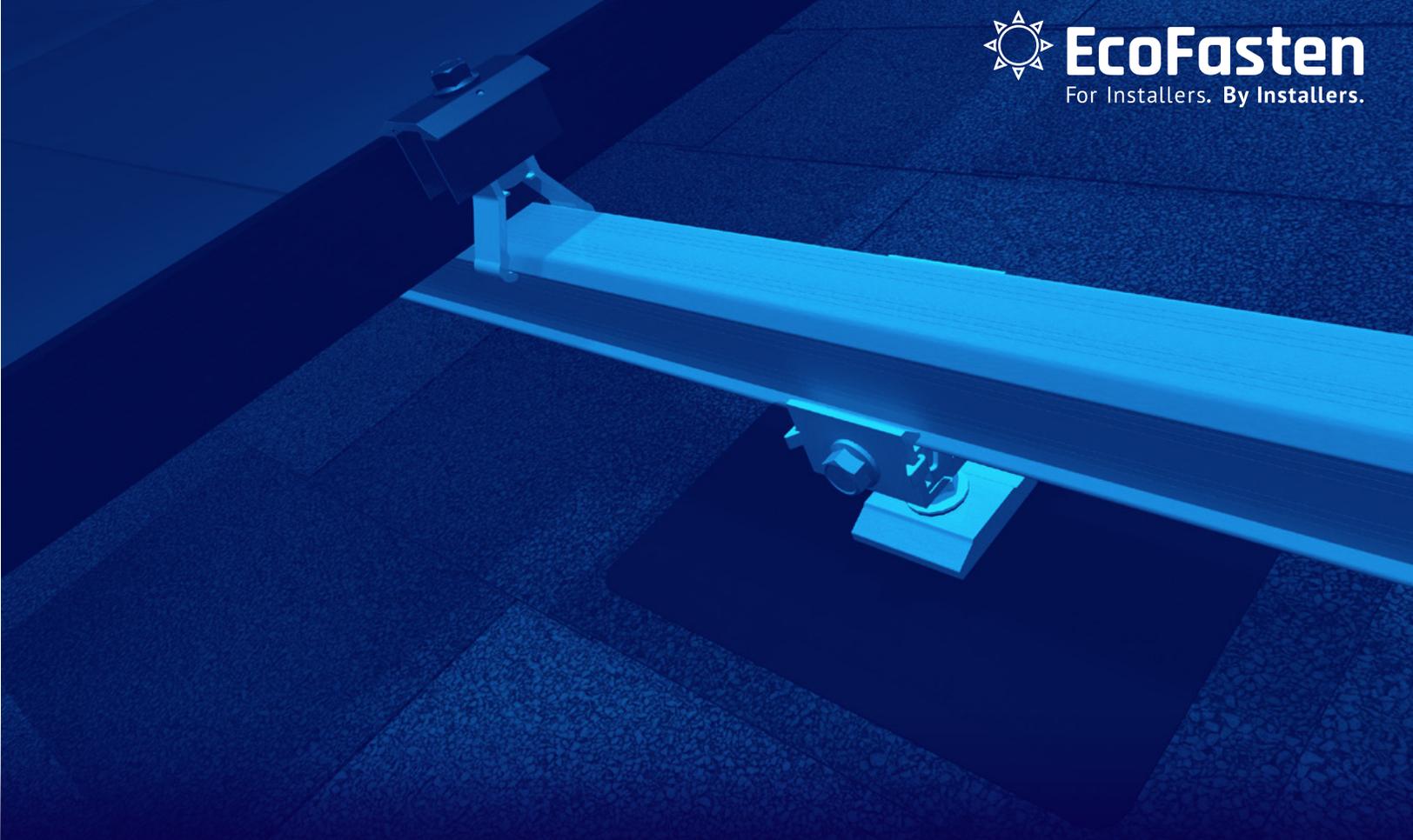
Frame Thickness	Article Number
30 mm	2099016
32 mm	2099017
35 mm	2099018
38 mm	2099019
40 mm	2099020
45 mm	2099021

## MID CLAMPS

Frame Thickness	Article Number
30-40 mm	2099022
40-50 mm	2099023

### INSTALLER RESPONSIBILITIES

Periodic re-inspection of components shall be performed to verify that there is no corrosion detrimental to system strength and electrical conductivity, no loose bolts, and/or other variables that could compromise array safety. Any corroded or damaged components shall be immediately replaced.



**CLICKFIT**®

# COMPLETE RAIL-BASED RACKING SYSTEM

## ADDENDUM

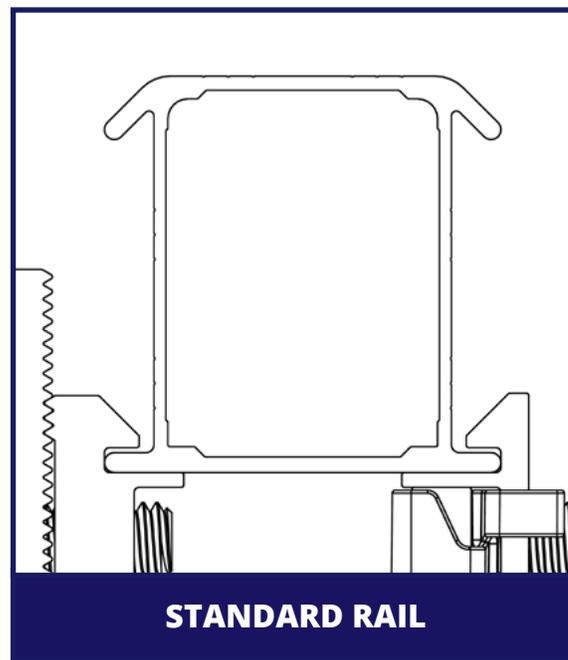
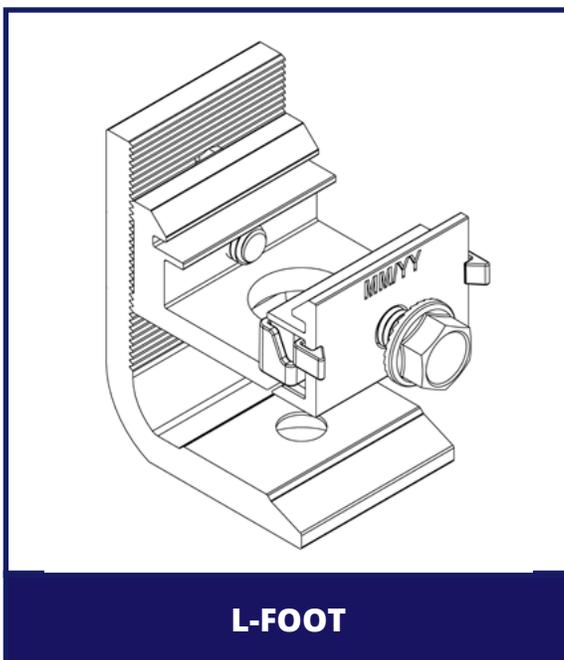
**REVISED:** 06/07/21

**VERSION:** v1.1



## ALTERNATE COMPONENTS ADDENDUM

The following components have been tested or evaluated with EcoFasten's ClickFit System. The ratings described in the ClickFit Installation Manual apply when using these alternate components.

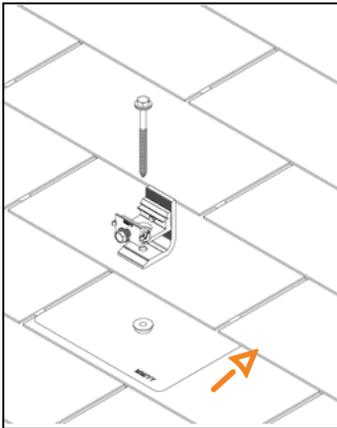


The components referenced in this addendum conform to STD UL 2703 (2015) Standard for Safety First Edition: Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels.



## FLASHING AND L-FOOT

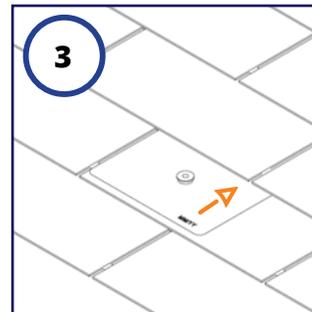
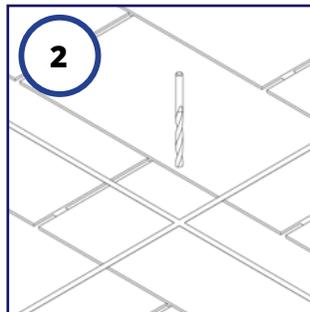
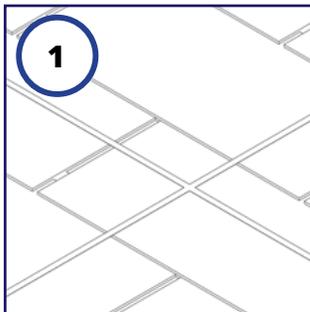
### Installation of Flashing and L-Foot



- ClickFit for comp shingle roofs uses EcoFasten Solar's GF-1 watertight flashing system.
- Other roof types may use different EcoFasten Solar attachments, visit [ecofastensolar.com](http://ecofastensolar.com) to learn about other applications.

\*Note the orientation of the L foot and Clicker. The two Clicker "arms" should be facing downslope\*

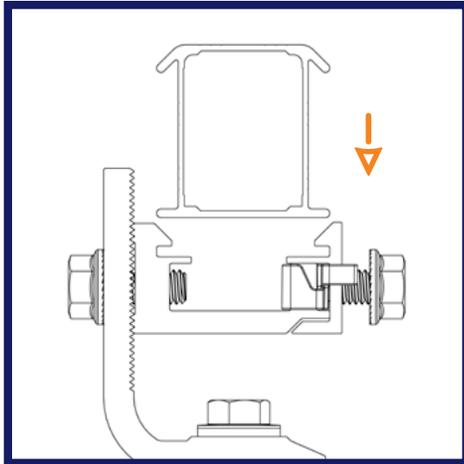
### Installation Steps:



1. Locate rafter lines.
2. Drill 1/4" pilot holes at all attachment points and back fill using roof-compatible sealant.
3. Separate shingles where flashing is to be installed. Insert the flashing so the top portion is under the next row of shingles North. Ensure the flashing is pushed to the third-course of shingle to prevent water infiltration through the vertical joints between shingles.
4. Align GF-1 flashing hole with pilot hole. Insert the lag bolt with pre-installed bonded washer through the L foot and EPDM grommet. Tighten the lag bolt until fully seated (a ring of EPDM is visible around the circumference of the bonded washer).

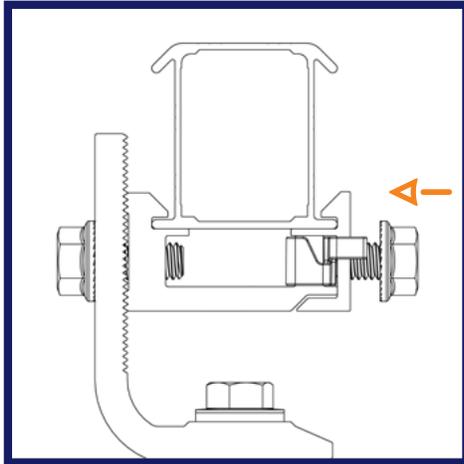


## INSTALLATION



1. Place the rail in the Clickers.
2. Ensure the rails extend a minimum of 2" past the last attachments in each row.
3. Push the rail into each L-foot; an audible click should be heard when the rail is fully seated.

Verify the rail is sitting flush with both ledges. If attachments are extremely misaligned it may be necessary to loosen the leveling bolt and adjust the height of the L-foot. Tighten the clamping bolt to 144 in-lbs.



4. Level the rail if necessary by loosening the bolt attaching the Clicker to the L-foot or tile hook.

