Tamarack Flush Mount
Solar Roof Mount System
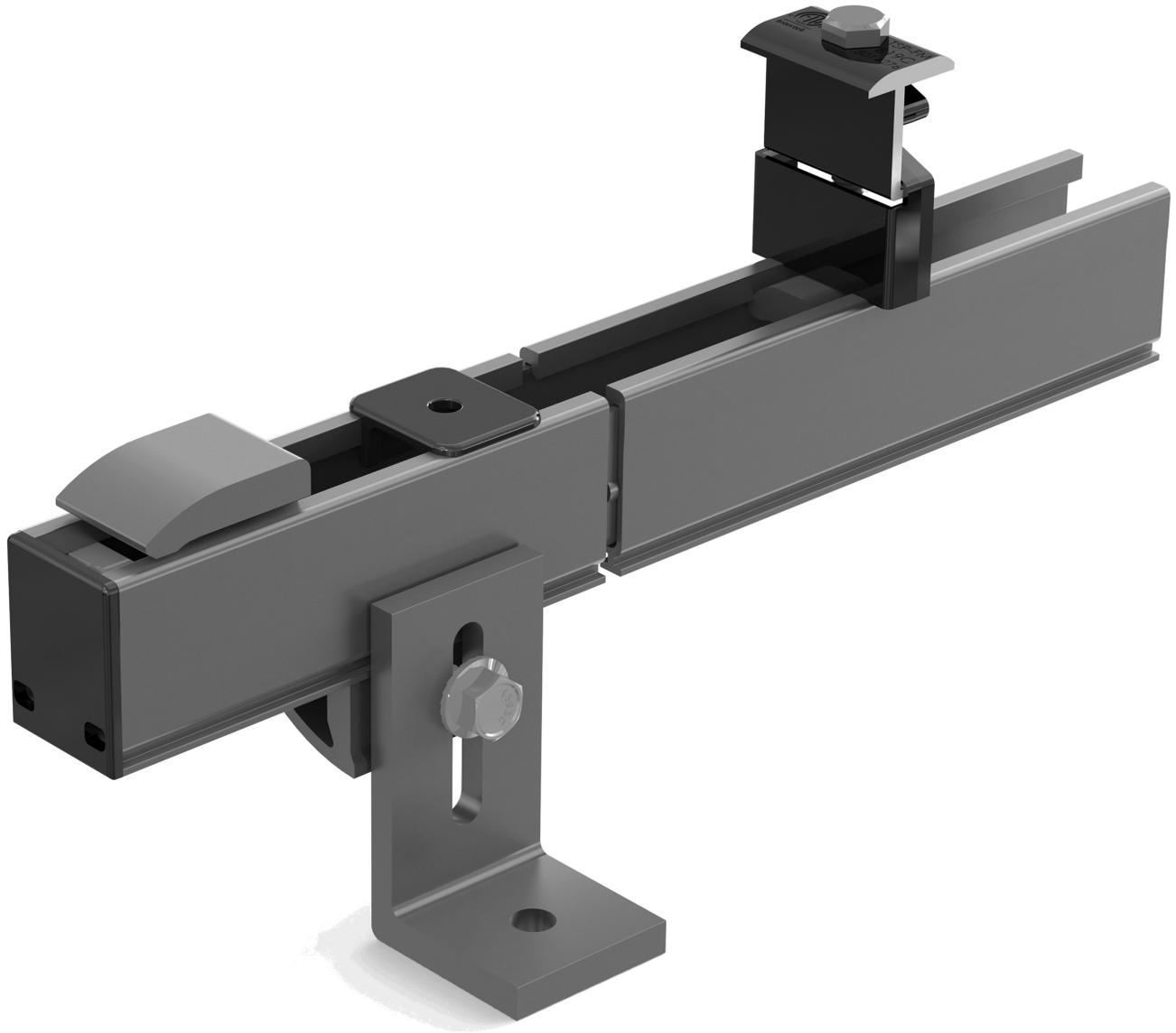
Installation Manual

Table of Contents

Technical Support: 707-234-8107 or 800-819-7236 ext.556

Tamarack Flush Mount System Features

- Designed for mounting on most residential roofs
- Can be installed with most available roof attachments for composition shingle, tile and metal roofs
- Only 4 tools required for installation
- Top clamps and rail attachments require the use of a single standard 1/2-inch socket
- One part for both mid-clamp and end-clamp use simplifies ordering and stocking parts
- Module clamps are spring loaded to ease module placement
- Two rail heights and one rail length
- Bonding splice installs easily without tools
- Built-in wire management for module and microinverter cables
- Sleek low-profile design eliminates the need for an array skirt
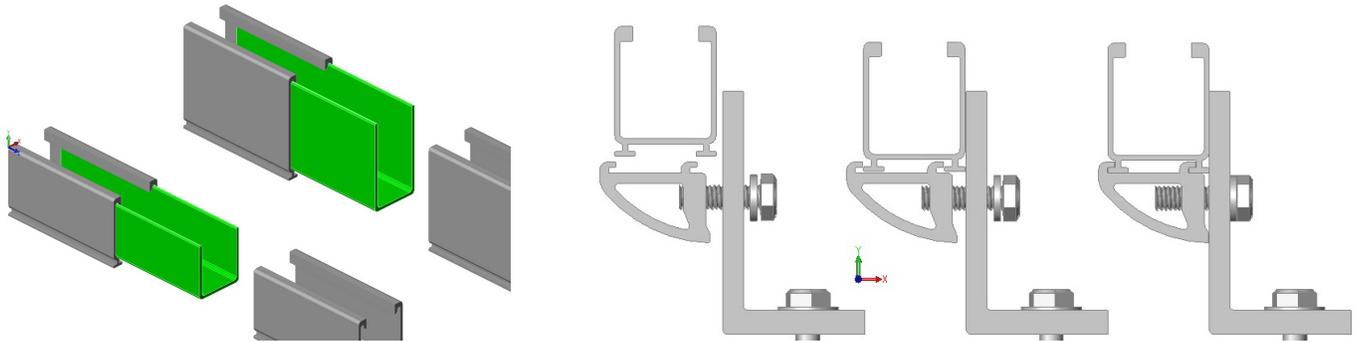
Tamarack Product Summary

Flush mount is a visually appealing, low profile, photovoltaic (PV) module installation system that significantly lowers PV module installation cost by allowing the installation professional to stock fewer parts and to complete the installation in less time.

Certified to meet local and International Building Codes when installed in accordance with this manual. The design load rating meets the minimum requirements of 10 PSF downward pressure, 5 PSF upward pressure and 5 PSF down-slope load. Module orientation may be portrait or landscape. Designed for use with most third-party roof attachments including Solar Roof Hooks, Quick Mount PV, Ironridge Flashfoot, S-5 Clamps, etc.

Class A Fire Rating per UL 1703 for steep roof slope applications when using Type 1 or Type 2 Listed Photovoltaic Modules. This is per Middleton fire test report 103427989MID-004.

ETL Listed to UL 2307 for bonding and grounding when installed in accordance with this manual.
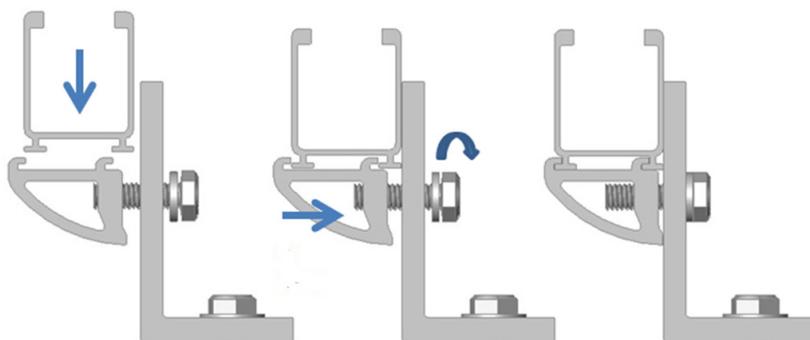
Rails, clamps, splices and mounting devices are UL2703 Listed for mounting flat-plate Photovoltaic Modules and Panels
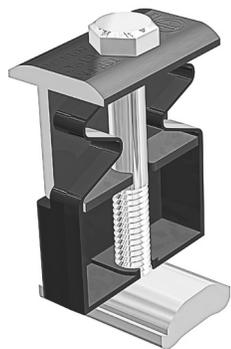
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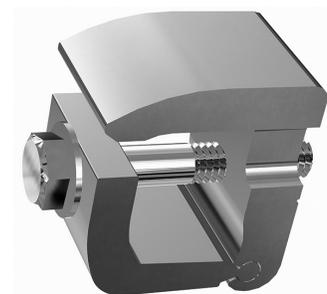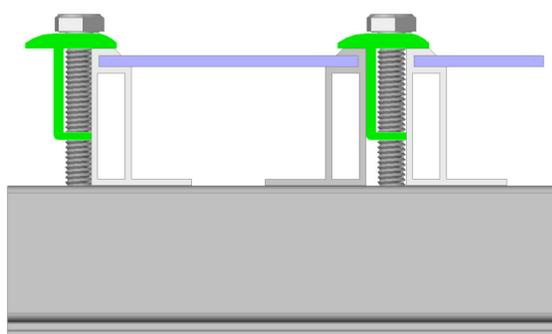# Tamarack Flush Mount System Components

2.3 inch and 1.6 inch Rail

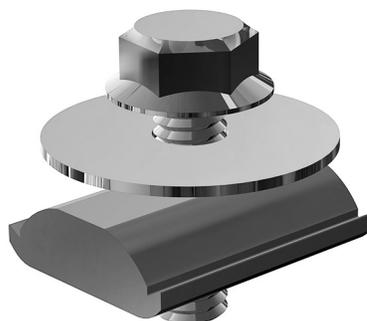Rail Mount and L-Foot

50-50 Clamp

Channel End Clamp

Bonding Splice

Wire Management Clip

Rail Ground Lug

MLPE Adapter

Rail End Cap

Tools Required

- Cordless Drill
- Torque Wrench
- Rachet and 1/2" Socket
- Level

Torque Specifications

Rail Mount with 5/16-inch bolt . . . . **12 ft-lbs**

MLPE Rail Attachment . . . . **12 ft-lbs**

Channel Clamp . . . . **12 ft-lbs**

5050 clamp as Mid Clamp . . . . **12 ft-lbs**

5050 clamp as End Clamp . . . . **6 - 9 ft-lbs**

Rail Ground Lug . . . . **12 ft-lbs**

MLPE Adapter . . . . **12 ft-lbs**

Ilsco SGB-4 Module Frame Ground lug . . . . **12 ft-lbs**

Prepare for Installation

Plan the PV module layout that fits the roof and confirm that plans comply with local AHJ requirements.

The rails can be installed parallel or perpendicular to the roof rafters. Center the rails over the structural menbers as much as possible.

Leave enough room to work safely around the aray during the installation process. Some building and fire codes require minimum clearances around PV module installations.

The length of the rails for each row in the installation will be equal to the total width of the modules plus 1/2-inch for each 50-50 clamp used between modules plus 2-inches total for end clamping. When using the channel end clamp, rails can be cut to the edge of the array.

Install proper roof mount flashings per the manufacturer's instructions. The maximum allowable spans between roof supports is 6 feet.

Attach Rail Mounts

Each Rail-Mount consists of two parts, a 5/16 inch bolt and a clamp extrusion. The rail adapters have been designed to interface with off-the-shelf mounting products that have vertical leveling slots. Our Rail Mounts work with most products that have 5/16 inch or 3/8 inch bolt slots. We also offer our own L foot for mounting to products that have a flat mounting surface, such as seam clamps, exposed beams or Quick Mount Q Blocks.
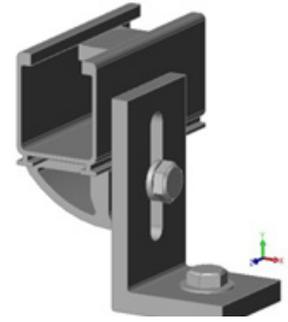
Install Rails

Rails are sold in convenient 84-inch and-126 inch lengths. This length is enough for two or three 60 cell or 72 cell modules with a width of up to 40.5 inches. Use a Tamarack bonding splice to connect each section of rail in a row.
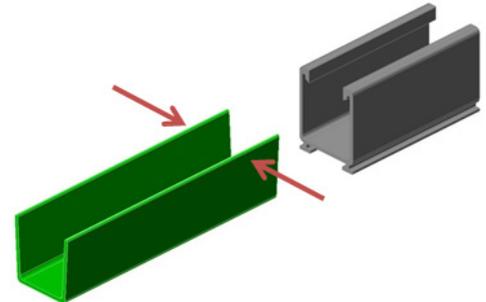
If a cut section of rail is required for the installation, it must not be installed at the end of a row. Each section of rail at the end of a row must be supported by two mounts before being spliced. If a rail section has a splice and 3 roof mounts, the splice should be located within 1/3 rail span of the middle mount.

Rail mounting is simple and easy. The Rail Adapter clamps to the two feet on the bottom of the rail. There is never any drilling, and parts can be brought on the roof fully assembled and ready to be installed. Rail Adapters may be installed anywhere on the rails, including at splices and they will not interfere with module mounting clamps.
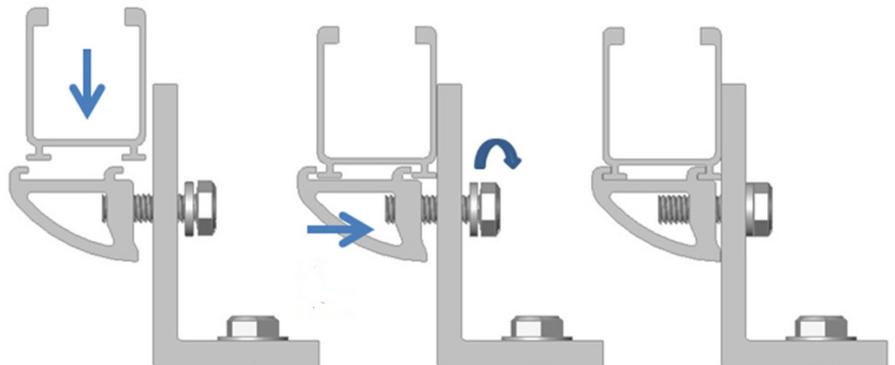
Simply position the adapter into the two feet on the bottom of the rail, and tighten the bolt slightly. Leave the bolt slightly lose to allow leveling of the rails in the next step.

Leveling Rails

Start by leveling the bottom rail of the array first. Set the Rail Adapters near the middle of the leveling range and adjust as necessary to have visually level rails. Tighten the attachment bolts to the specified torque when they are aligned. Level the top rail of the array in the same manner.

If there are multiple rows of rails in the array, use a string level or straight edge to help adjust the remaining rows to be level with the top and bottom rails. It is also possible to visually align rails in the middle of the array.

Tighten all hardware to the specified torque.
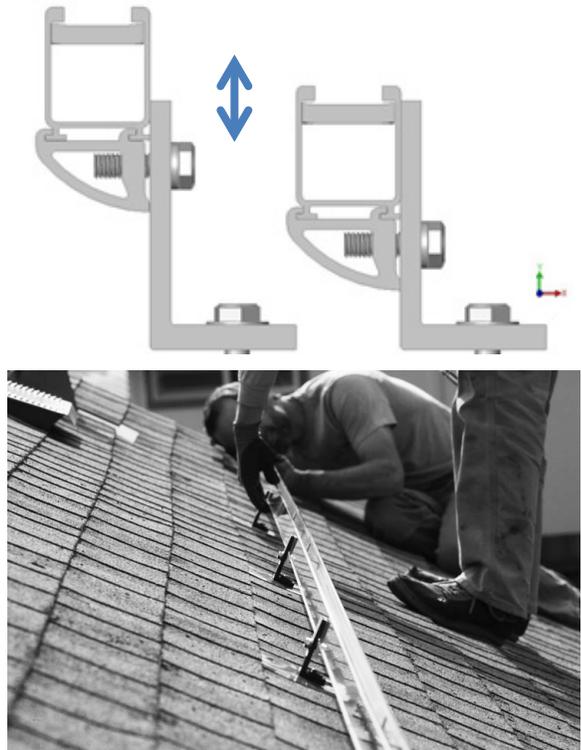
Grounding

Tamarack rails and PV modules are bonded by 50-50 Module Clamps and bonding splices. The 50-50 clamps acheive bonding to the module frames by stainless-steel pins in the clamping surface of the clamp tops, which penetrate module frame coating. The rails and channel nuts are bonded because of the conductive surface of the mill finish aluminum used in the rail construction.

SolarEdge Optimizers and Enphase Microinverters are bonded to the rail with the Tamarack MPLE adapters.

Bonding Method 1: Rail Lug
Use a Ground Clamp to bond a ground conductor to a rail.

Bonding Method 2: Frame Lug
Use a module ground lug to bond a module frame to a ground conductor. The resulting system is bonded primarily through the module frames.

Grounding Diagrams

Rail Grounding method

50	50-50 Clamp
C	Channel Clamp
G	Ground Lug
▭	Bonding Splice
	Minimum 10 AWG Copper Wire
↓	Fault Path
	Rail

Frame Grounding Method

50	50-50 Clamp
C	Channel Clamp
G	Ground Lug
▭	Bonding Splice
	Minimum 10 AWG Copper Wire
↓	Fault Path
	Rail

Rail Grounding method with SolarEdge Optimizers

Legend:

Symbol	Description
50	50-50 Clamp
C	Channel Clamp
G	Ground Lug
▭	Bonding Splice
⏚	Minimum 10 AWG Copper Wire
↓	Fault Path
▭	Rail
▮	SolarEdge Optimizer

Frame Grounding method with SolarEdge Optimizers

Legend:

Symbol	Description
50	50-50 Clamp
C	Channel Clamp
G	Ground Lug
▭	Bonding Splice
⏚	Minimum 10 AWG Copper Wire
↓	Fault Path
▭	Rail
▮	SolarEdge Optimizer

Module Level Power Electronics

Use the Tamarack MLPE Rail Adapter to attach Enphase microinverters or SolarEdge Optimizers to the rails.

The large flat washer is installed between the mounting plate of the MLPE and the top of the rail. Tighten the bolt with a 1/2" socket to the proper torque.
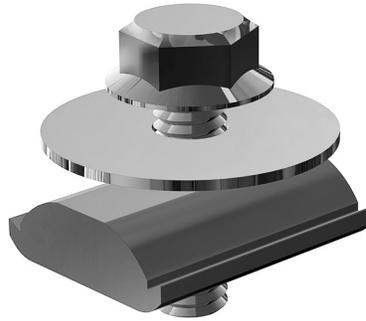
Wire Management

Place electrical conductors and connectors at the bottom of the rail channels.

Install the wire protection clips where necessary to keep wires in the channels.

When using 1.6 inch rail, it is possible to damage connectors or large bundles of wire when 50-50 bolts are tightened. Position connectors and bundles appropriately to prevent risk of ground faults.

Module Installation

Start module installation at one end of the rails. If there are multiple rows, start on the bottom row.
Install a 50-50 clamp at the end of each rail with the side of the clamp with 2 bonding pins on the module frame. Push the channel nut into the rail. The integrated spring assembly will hold the clamp in place.
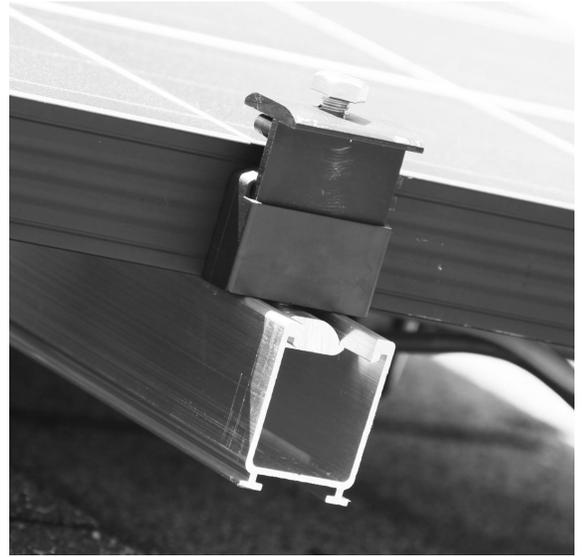

Place the first module onto the rails so that it is centered over the rails. Make sure the module is touching the inside edge of the clamps and tighten the clamps with a 1/2" socket.

Install 50-50 Clamps in each rail on the other side of the first module. The springs will hold the clamps in place prior to tightening. Place the second module on the rails, align it with the first module, and push in against the clamps. Tighten the clamps to fully secure the module.

Install the remaining modules and clamps on the rails in the same manner, aligning the corners of the modules.

On the outside edge of the last module, install the clamps so that the side with the two stainless-steel pins is on the module frame. Tighten all bolts to the specified torque.

Do a final check to be sure that all installation hardware on the array is properly tightened.

Channel End Clamps

Channel End Clamps may be used in place of the 50-50 clamps at the ends of rails. Channel Clamps secure the module frame from below and allow the rails to be cut flush to the edge of the array for a clean look.

Insert channel end clamp in the rail. The module must be lifted slightly to slide the clamp under the frame.

Allow the module to rest on the rail again and slide the clamp back toward the end of the module until it is flush with the outside end of the module frame and tighten lightly. Feel under the array to check that the clamp is clamping the module flange securely, then tighten to the specified torque.
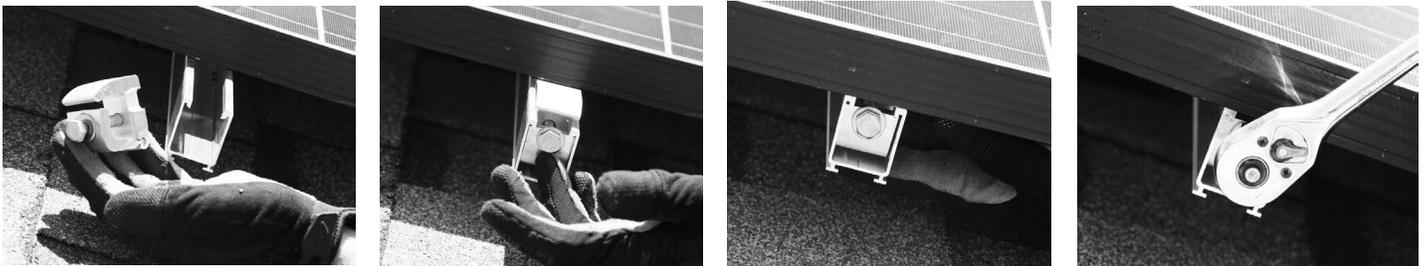
End Caps

Place an end cap at the end of each rail to inprove the look of the system. Drain holes on the bottom of the end caps ensure that water does not accumulate in the rails.

Disclaimer

This manual describes proper installation procedures and provides necessary standards required for product reliability. Warranty details are available on our website. www.tamaracksolar.com
All installers must thoroughly read this manual and have a clear understanding of the installation procedures prior to installation. Failure to follow these guidelines may result in property damage, bodily injury or even death.

Installers Responsibilities

- Follow all applicable local or national building and fire codes, including any that may super sede this manual.
- Electrical installation should be conducted by a licensed and bonded electrician or solar con tractor.
- Module maintenance or removal must not break the bonding path of the system.
- Ensure all products used are appropriate for the installation and array under the site's loading conditions.
- Use only Tamarack parts or parts approved by Tamarack; substituting parts may void any ap plicable warranty.
- Comply with all applicable fire codes including, but not limited to, keeping walkways clear.
- Ensure bare copper grounding wire does not contact aluminum and zinc-plated steel compo nents, to prevent risk of galvanic corrosion.
- If loose components or loose fasteners are found during periodic inspection, retighten imme diately. If corrosion is found, replace affected components immediately.
- Provide an appropriate method of direct-to-earth grounding according to the latest edition of the National Electrical Code, including NEC 250: Grounding and Bonding, NEC 690: Solar Photovoltaic Systems, and CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1
- Disconnect AC power before servicing or removing microinverters and power optimizers.
- Review module manufacturer's documentation to ensure compatibility and compliance with warranty terms and conditions.
- Maximum Series Fuse Rating of 20 Amps.

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Certified Module List for UL2703 Listing Program

Manufacturer	Model
Aleo	P18/P19/S18/S19/S59/S79.
AU Optronics	PM Series
Astronergy	modules with 30, 35, 40, and 45 mm frames aaSMbbyyC/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
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
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
Boviet	Boviet modules with 35 and 40mm frames - BVMZZaaYY-xxxBcc Where "ZZ" can be 66 or 76; "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-BF-DG, H-HC, H-HC-BF, H-HC-BF-DG, HC-BF or HC-BF-DG]
BYD	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
Canadian Solar	Canadian Solar modules with 30, 32, 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
CentrsoSolar	C and E series.
Certainteed	CertainTeed modules with 35 and 40 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, or 04
CSUN	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, M or MM; "bb" is blank, BB, 5BB, BW, or ROOF
Dehui	Dehui modules with 30, 35 and 40mm frames - DH-MYYYZ-xxx Where "YYY" can be 760, 772, 860, 872; and "Z" can be B, F or W
Eco Solargy	ORION 1000 ECOXXXH156P-60, APOLLO 1000 ECOXXXT156M-60, and APOLLO 1000 ECOXXXA156M-60.
ET Solar	30, 35, 40, and 50 mm frames ET-Y6ZZxxxAA Where "Y" can be P, L, or M; "ZZ" can be 60, 72 or 72BH; and "AA" can be GL, WB, WW, WBG, WWG, WBAC, WBCO, WWCO, WWBCO or BBAC
GCL	40mm frame: GCL-P6/72, 35mm frame: GCL-P6/72, GCL-P6/72H, GCL-M6/72, GCL-M6/72H, 35mm frame (Black frame): GCL-P6/60, GCL-M6/60
GigaWatt Solar:	Gigawatt modules with 40 mm frames - GWxxxYY Where "YY" can be either PB or MB
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+/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, 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, L-G8.3/BFG, L-G8.3/BGT, 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-G9.3/BFG, XL-G10.2, XL-G10.3, XL-G10.c, XL-G10.d, XL-G10.d/BFG or XL-G10.3/BFG
Hansol	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]
Heliene	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]
HT Solar	HT60-156(M) (NDV) (-F), HT 72-156(M/P)
Hyundai	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 GI, HG, HI, KI, MI, MF, MG, PI, RI, RG, RG(BF), RG(BK), SG, TI or TG
ITEK	40 and 50 mm frames IT-xxx-YY Where "YY" can be blank, HE, or SE, or SE72
JA Solar	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, or 72; "ww" can be D09, S01, S02, S03, S06, S09, S10, or S12; and "aa" can be BP, MR, SI, SC, PR, 3BB, 4BB, 4BB/RE, 5BB
Japan Solar	JPS-xxxP-60 (35mm), JPS-xxxM-60 (35mm), JPS-xxx-P-72 (40mm), JPS-xxxM-60-BB (35mm), JPS-xxx-P-72-BB (40mm)
Jinko	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, 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
Kyocera	KU26x-6MCA where x is 0 or 5.
LG	[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]
LONGi	[Longi modules with 30, 35 and 40 mm frames - LRa-YYZZ-xxxM Where "a" can be 4, 5 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]
Mission Solar	33 and 40 mm frames MSEbbxxxZZaa Where "bb" can be blank or 60A; "ZZ" can be blank, MM, SE, SO, SQ , SR, or TS; and "aa" can be blank, 1J, 4J, 4S, 5K, 5T, 60, 6J, 6S, 6W, 8K, 8T, or 9S
Mitsubishi	Mitsubishi modules with 46 mm frames - PV-MYYxxxZZ Where "YY" can be LE or JE; and "ZZ" can be either HD, HD2, or FB

Certified Module List for UL2703 Listing Program

Manufacturer	Model
NSP	D6M and D6P
Panasonic	30 mm frames EVPVxxxA, Where "A" can be blank or KPanasonic 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
Peimar	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)
Phono Solar	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]
Risen	RSM72-6 (MDG) (M), RSM60-6
REC Solar	REC modules with 30, 38 and 45 mm frames - RECxxxYYZZ Where "YY" can be AA, M, NP, NP2, PE, PE72, TP, TP2, TP2M, TP2S, TP3M or TP4; and "ZZ" can be blank, Black, BLK, BLK2, SLV, 72, or Pure
Renesola	Virtus II with module ratings of 250-260 in increments of 5. 156 series with module ratings of 270-275.
S-Energy	S-Energy modules with 35 and 40mm frames - SABB-CCYYY-xxxZ Where "A" can be C, D, L or N; "BB" can be blank, 20, 25, 40 or 45; "CC" can be blank, 60 or 72; "YYY" can be blank, BDE, MAE, MAI, MBE, MBI, MCE or MCI; and "Z" can be V, M-10, P-10 or P-15
Seraphim Energy Group	Seraphim modules with 30, 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, BMA-BG, BMB-HV
Seraphim USA	Seraphim modules with 30, 35, 40 and 50 mm frames - SRP-xxx-YYY-ZZ Where "xxx" is the module power rating; and "YYY" can be BMA, BMD, 6MA, 6MB, 6PA, 6PB, 6QA-XX-XX, and 6QB-XX-XX; ZZ is blank, BB, BG or HV
Sharp	60 and 72 NUSA-xxx/NUSC-xxx
Silfab	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
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, 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
Solaria	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
Sonali	SS 230 - 265
SunEdison	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
Suniva	Suniva modules with 35, 38, 40, 46, and 50 mm frames - OPTxxx-AA-B-YYY-Z and 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
Sunpower	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
SunSpark	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
Suntech	35, 40 and 50mm frames STPxxxy-zz/aa Where "y" is blank or S; and "zz" can be 20, 24, A60 or A72U; and "aa" can be Vd, Vem, Vfw, Vfh, Wdb, Wde, Wd, or Wfhb
Talesun	Talesun modules with 30, 35 and 40mm frames - TA6yZZaaxxx-b Where "A" can be D or P, "y" can be blank, F, G, H, I, 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)
Tesla	Tesla modules with 40 mm frames - TxxxY Where "Y" can be H or S
Trina Solar	Trina Modules with 30, 35, 40 and 46mm frames - TSM-xxxYYZZ Where "YY" can be DD05, DD06, DD14, DE14, DE15, DE15V, DEG15, DEG15VC, DE19, DEG19C.20, DE06X, PA05, PC05, PD05, PD06, PA14, PC14, PD14, PE14, or PE15 ; and "ZZ" can be blank, .05, .05(II), .08, .10, .18, .08D, .18D, 0.82, .002, .00S, 05S, 08S, .20(II), A, A.05, A.08, A.10, A.18, (II), 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)
Upsolar	UP-MxxxP, UP-MxxxP-B, UP-MxxxM, UP-MxxxM-B
Vikram	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
Yingli	YL xxx P-29b, YLM 60, YLM 72, YGE, YGE-VG, YLM, YL xxx P-35b, YL xxx D-30b, YL xxx D-36b
Waaree	AC, Adiya 60/72 Mono/Poly Black, Adiya 60/72 Multi
Winaico	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

Certified Power Optimizer List for UL2703 Listing Program

Manufacturer	Model
Enphase	M250-72, 250-60, M215-60, C250-72, S230, S280, IQ 6, IQ 6+, IQ 7, IQ 7+, IQ 7X, Q Aggregator
Solar Edge	P300, P320, P340, P370, P400, P405, P505, P600, P700, P730, P800p, P800s, P850, P860