

# Power Peak™ AL Integrated Grounding Guidelines

**CAUTION:**

Ground Clips are designed for one time use only. After torque pressures have been applied, they cannot be removed and re-used. If removed, they must be discarded and replaced with new Ground Clips.

**⚠ WARNING:**

Electrical hazard will exist if Ground Clips are not installed per these instructions. Failure to do so could lead to severe personal injury or death.

All surfaces that mate to the Ground Clip must be free of burrs or debris from drilling or other actions which could interfere with the electrical bond.

The Power Peak large scale solar mounting system features a third party tested, integrated grounding method that meets UL2703 for bonding all PV Modules and exposed metal framework components to earth as required by the National Electrical Code (NEC) for safety. Per NEC article 690.43(C), PV mounting structures may be used as an equipment grounding conductor connected to earth to create a system level bonding and grounding solution.

The Power Peak large scale solar mounting system is designed and tested to meet or exceed applicable code requirements. These guidelines provide the necessary information for proper electrical bonding and grounding the Power Peak mounting system to the equipment grounding conductor or to ground rods employed at the site. For additional information, review the site specific permit package and construction drawings as well as the Power Peak Assembly Instructions.

These guidelines include:

1. Power Peak primary component overview
2. Electrical bonding guidelines for the following connections:
  - PV Module to Mounting Rail Bonding Washer
  - Rail-to-Rail Bonding via Splice Plates
  - PV Module Mounting Rail to Strongback Bonding Bracket
  - Strongback to Vertical Beam Bonding Attachments
  - Structure to Structure Electrical Bonding
  - Bonding Structure(s) to Equipment or Earth Ground

## Power Peak Mounting System Component Overview

The Power Peak system includes three main structural components: the Steel Beams, Strongback Assemblies, and PV Module Mounting Rails. Collectively, these components form an electrically bonded unit. (See Figure 1)

In addition, the PV Modules are secured to the PV Module Rails using factory preassembled module clamps that include integrated grounding components.

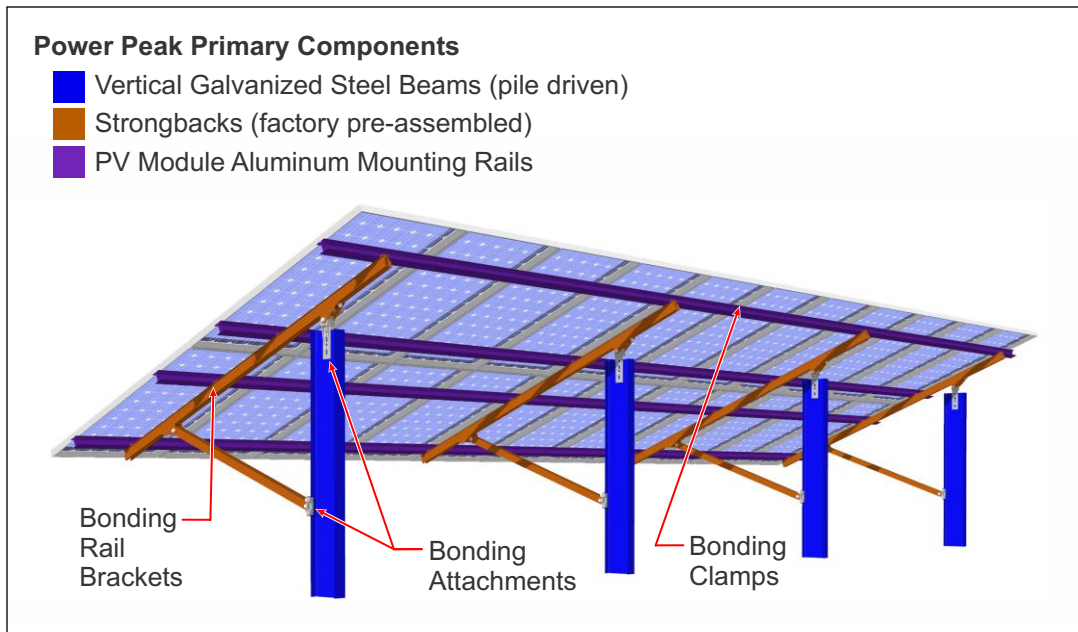


Figure 1: Power Peak Structural Components

### PV Module to Mounting Rail Bonding

The Power Peak system includes factory preassembled module clamps (both *end* and *mid* clamps) used to secure PV Modules to the mounting rails.

Power Peak ships with one of two approved module electrical bonding clamp configurations:

1. Mid Clamps with Bonding Washer and Mid Clamps without Bonding Washers (Figure 2).
2. AMP Clamp™, a self bonding Mid Clamp used in all instances where a Mid Clamp is required (Figure 5).

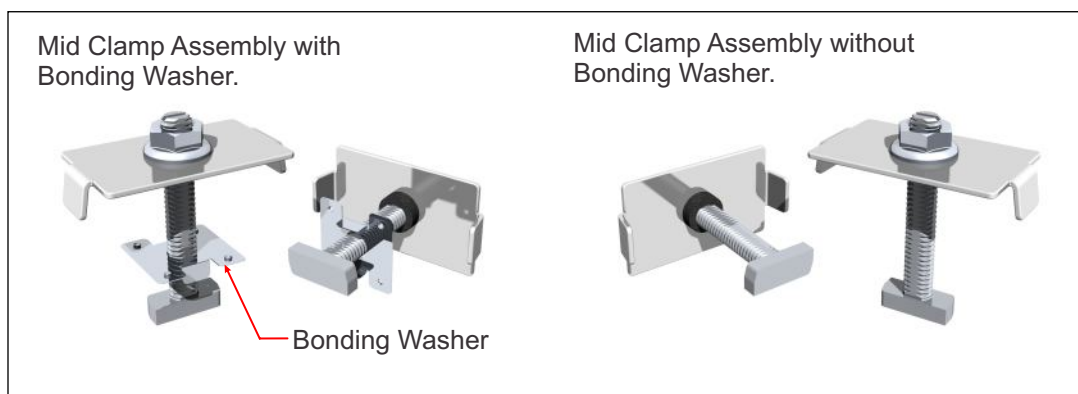


Figure 2: The two types of Mid Clamp Assemblies

### Mid Clamp with Bonding Washer - Module to Rail Electrical Bonding

During the assembly, the Bonding Washer is compressed between the frame of the PV Module and the mounting rail, creating an electrical bond (see Figure 3). The Bonding Washer has been tested to meet the UL2703 standard.

Once installed, a Bonding Washer effectively grounds two adjacent modules to the module rail. To ensure that each PV Module has been successfully grounded, follow the pattern of placing the Bonding Washers at their respective positions depending on whether the system has even or odd numbered Modules per row as shown in Figure 4.

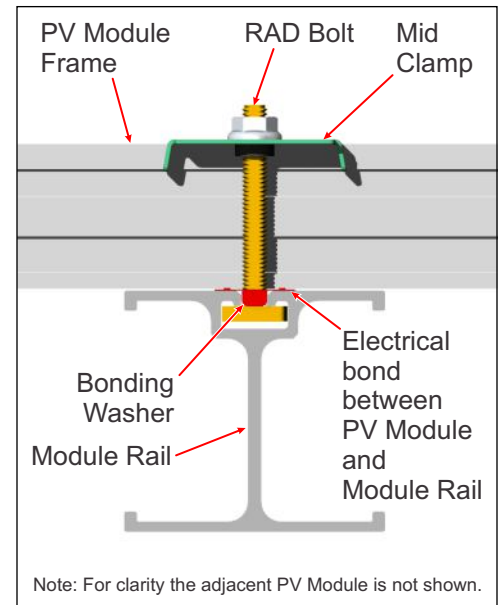


Figure 3: Electrical Bond between PV Module Frame and Rail

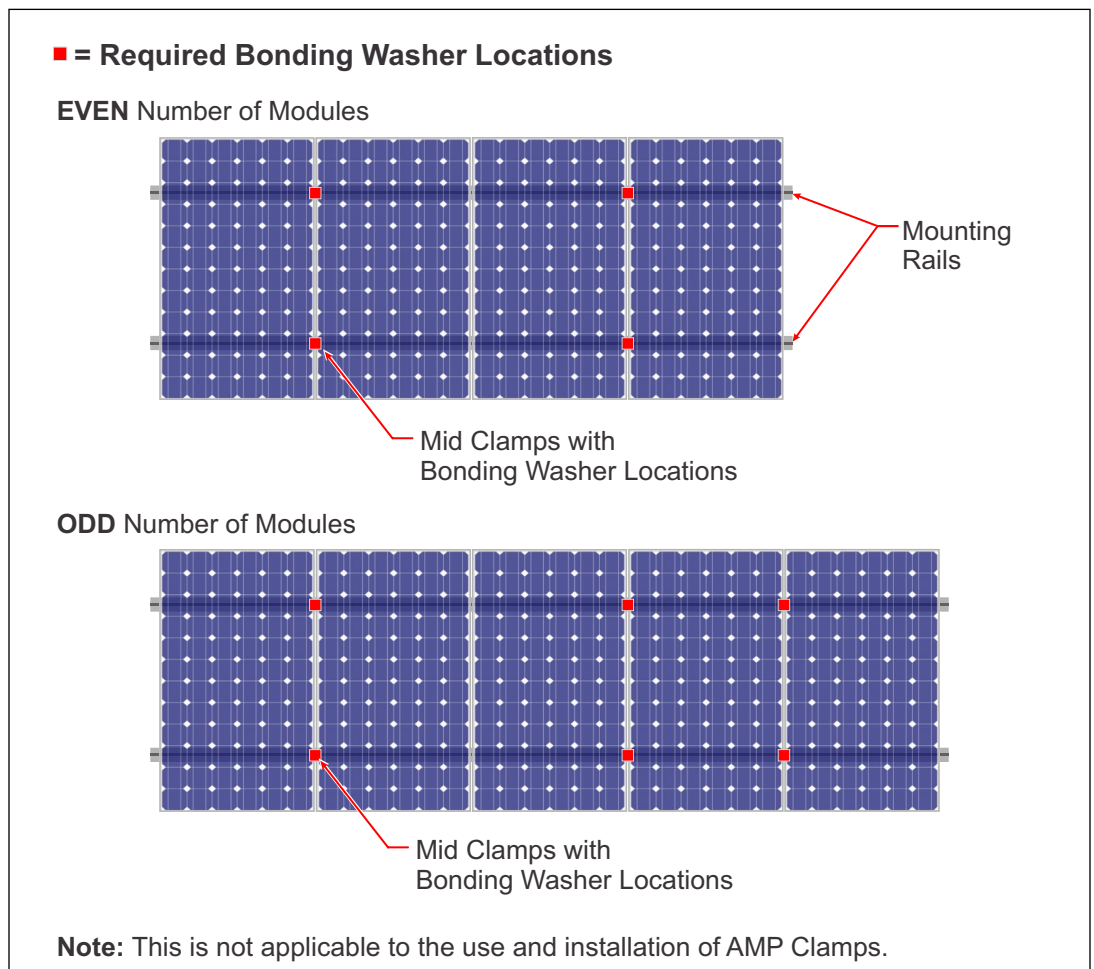


Figure 4: Where to install Bonding Washers (Even and Odd rows)

### AMP Clamp - Module to Rail Electrical Bonding

Third-party tested and certified, the AMP Clamp penetrates and electrically bonds the module to rail by penetrating the anodized module frame, effectively bonding the modules to the mounting rails and eliminating the need for separate bonding washers.

AMP Clamps are placed in every instance where a Mid Clamp is required for shipments shipped with AMP Clamps.

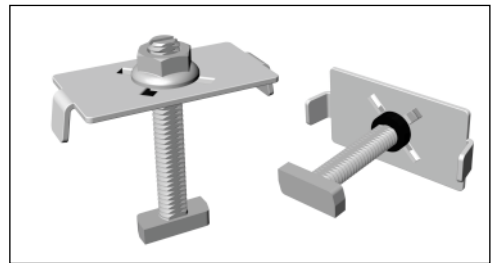


Figure 5: AMP Clamp Mid Clamp

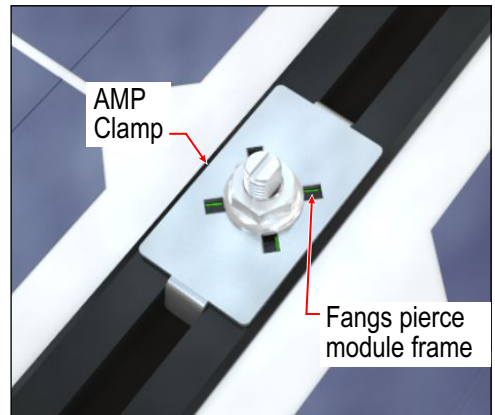


Figure 6: AMP Clamp Electrical Bond between Frame of PV Module and Rail

### Rail-to-Rail Splice Bonding

Splice Plates are used when splicing Rail sections together, they also ensure a bond between the two Rails. The Splice Plate has been third party tested and certified to UL 2703.

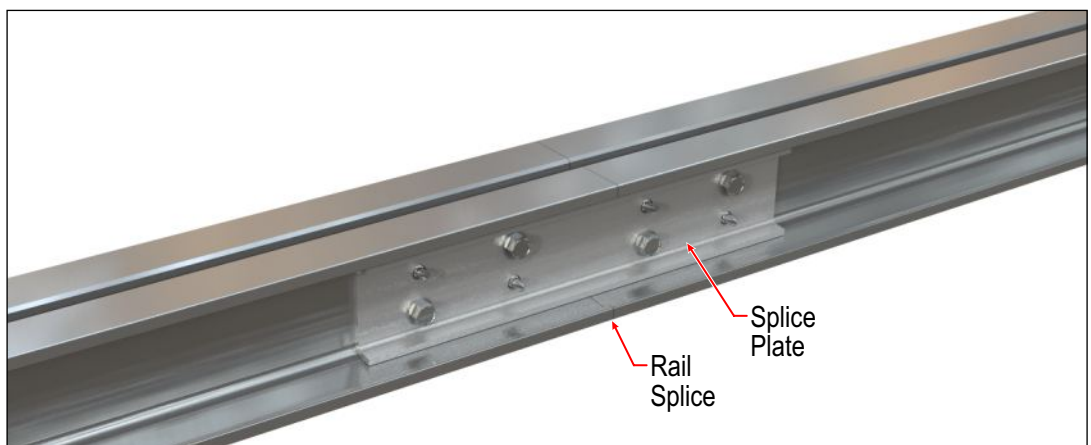


Figure 7: Rail-to-Rail Bonding

## PV Module Mounting Rail to Strongback Bonding Bracket

The Power Peak system includes factory preassembled Strongbacks for supporting the east/west PV Module Mounting Rails. One component of the Strongback Assembly is the Rail Bracket Assembly, used to secure the east/west Mounting Rails to the Strongbacks. Figures 8 and 9 identify these various components and show their assembled relationships. The Rail Bracket has been third party tested and certified to UL 2703.

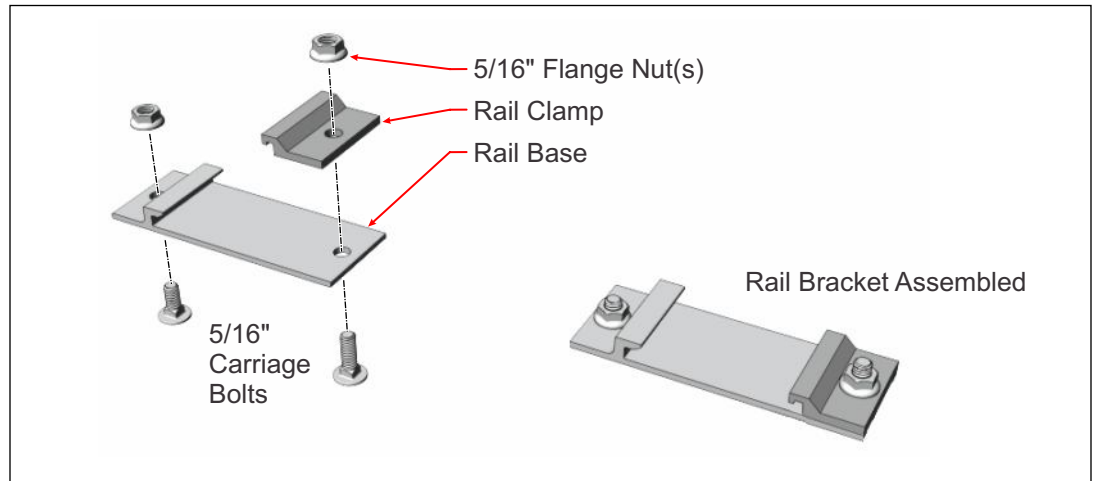


Figure 8: Rail Bracket Assembly

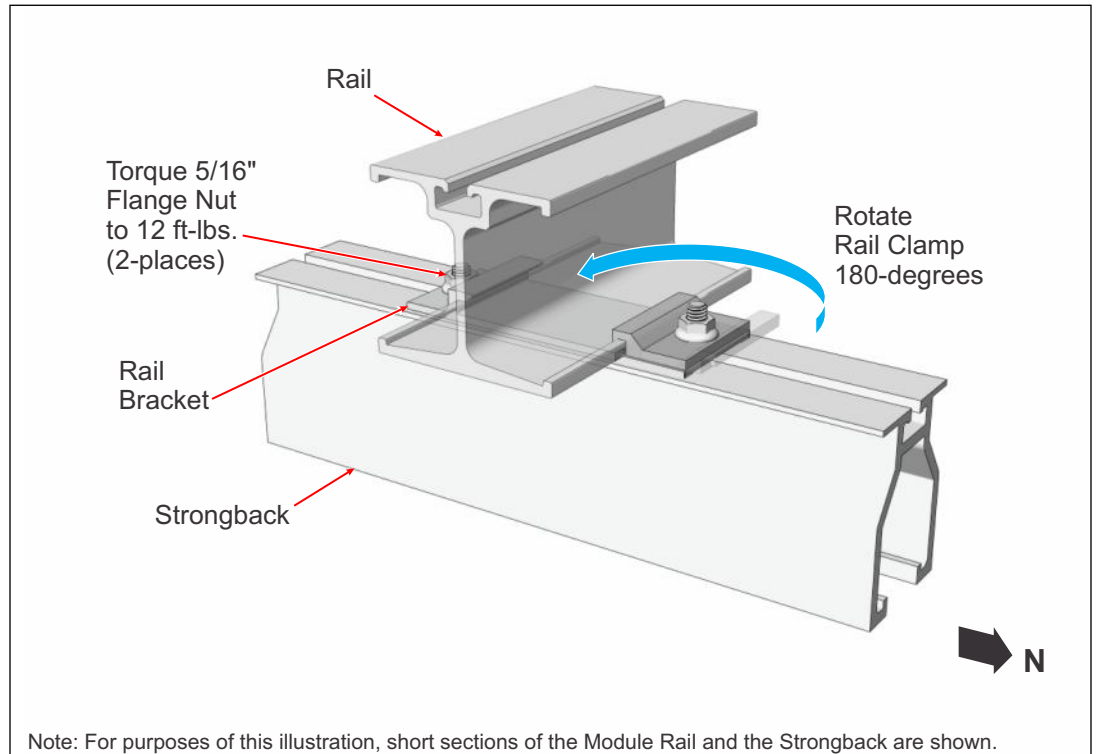


Figure 9: Installing the Rail (Strongback application)

**CAUTION:**

A bare copper conductor is not to be in contact with the PV Module Mounting Rails or Strongbacks. The direct interface between bare copper and aluminum will exhibit accelerated galvanic corrosion and may cause premature failure.

**WARNING:**

All bonding devices and grounding devices **MUST** be tightened to the proper manufacturer's recommendation. Failure to do so could lead to electrocution, serious personal injury and/or death.

### Strongback to Vertical Beam Bonding Attachments

The Power Peak factory preassembled Strongbacks are attached to the galvanized vertical support beams at two points. Both attachment points include galvanized ductile iron fittings and galvanized hardware. When bolted together with the galvanized beam, the connections provide electrical continuity (see Figure 10). Reference the Power Peak Assembly Instructions for proper torque requirements. The attachment points have been third party tested and certified to UL 2703.

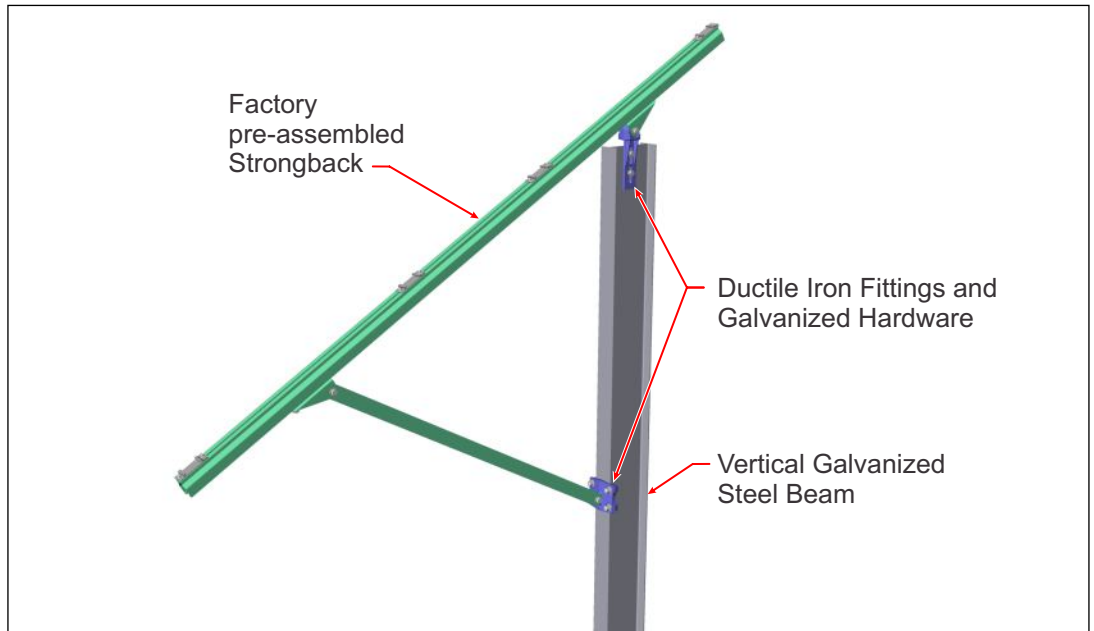


Figure 10: Strongback to Vertical Beam Electrical Bonding

### Structure to Structure Electrical Bonding

A typical large scale solar installation consists of multiple Power Peak mounting structures. Since each structure is an electrically bonded unit, two or more adjacent structures may be bonded together from a single point with an NEC approved wire conductor. An approved grounding lug may be used to connect the copper wire at either of the following recommended locations.

- The end of any one of the four PV Module Mounting Rails on each structure; or
- The end of any one of the Strongback aluminum extrusions on each structure.

### Bonding Structure(s) to Equipment or Earth Ground

Each structure or group of bonded structures is to be connected to an equipment ground or earth ground via an NEC approved wire conductor. The copper wire conductor may be connected to the structure at any one of the PV Module Mounting Rails or Strongbacks using an approved lug.

### Module to Rail Electrical Bonding

When used in conjunction with the listed minimum torque values and installation methods within these installation guidelines, the Ground Clip has been tested to be utilized as a grounding/bonding device equivalent to 6 AWG copper wire and has been tested to meet or exceed the requirements of UL2703.



## **PREFORMED** LINE PRODUCTS

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