

## ZIF III Advantages over Wedge Style Board Retainers

### Introduction

The advantages that ZIF III board retainers provide over wedge style retainers provide system integrators the opportunities for better heat management and simplified board loading.

### Description

The ZIF III retainer is designed to mount to the PC board with the board in contact along the full length of the retainer. The board and retainer assembly is securely locked into a cold-wall with a simple quarter-turn. There are no torque wrenches or settings needed with the ZIF III.

The unique locking design of the ZIF III produces a uniform distribution along the PCB edge and once the assembly is mounted into the cold plate, provides improved heat transfer and resistance to extreme shock and vibration. Both braze and screw mounting of the ZIF III is available and both provide uniform mounting pressure to the PCB with no board warping.

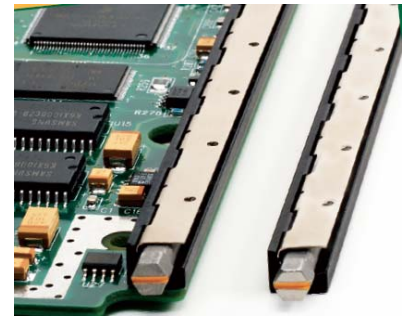


Figure 1. ZIF III retainer both mounted and un-mounted on PCB.

The quarter-turn lock and unlock allow quick loading and unloading of boards. The slot in the hex-head rod is colored to provide visual indication of the lock-status of the retainer.

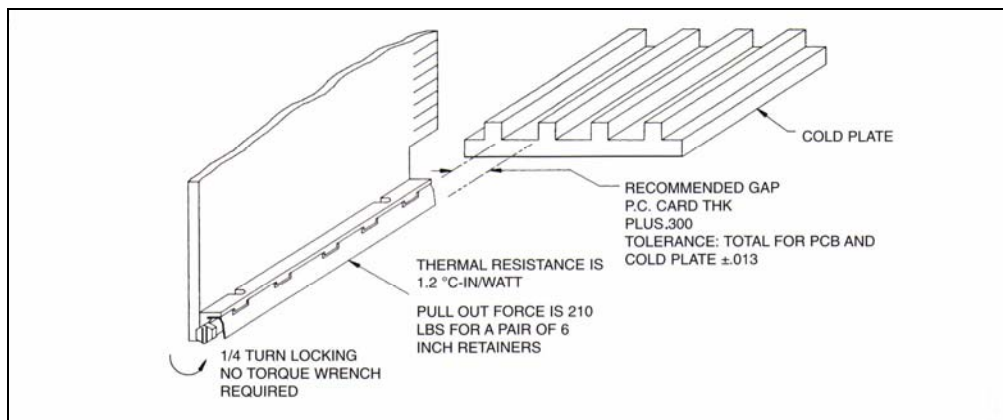


Figure 2. Typical ZIF III assembly and cold plate mounting arrangement.

Figure 3 demonstrates how force is evenly distributed along the length of the ZIF III retainer and PCB rather than concentrated into narrow bands, as shown in the wedge retainer. The even pressure and uniform contact maximize force and heat transfer on both sides of the cold wall, as shown by the arrows. By design, the wedge style retainers have the potential to create air gaps and hot spots.

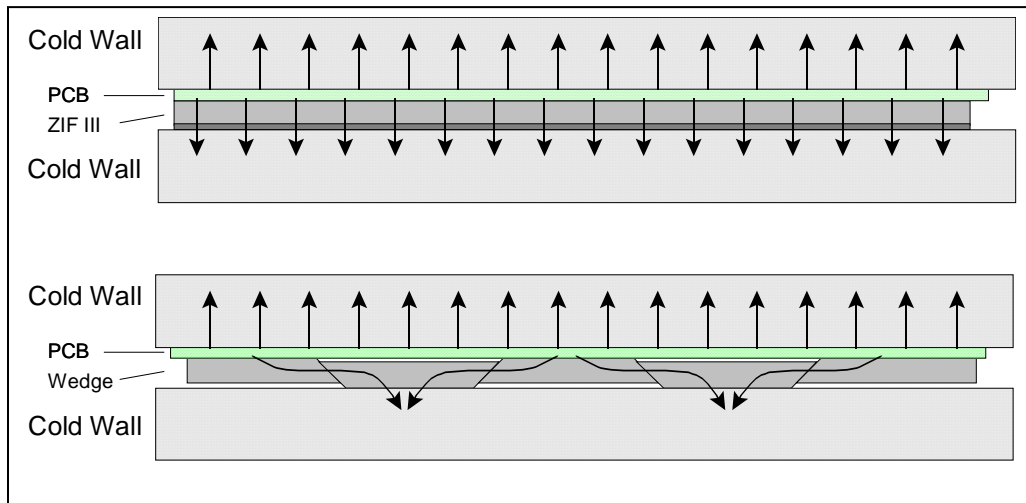


Figure 3. ZIF III assembly and cold wall.

Table 1 shows a comparison between the ZIF III and wedge style retainers.

Parameter	ZIF III Retainer	Wedge Style Retainer
Insertion and Extraction Force	Zero.	Zero, if fully disengaged and properly aligned. In practice, wedges twist out of orientation, causing drag and wear.
Clamping Pressure	Features a constant cross-sectional rod, resulting in uniform pressure along the PCB edge for excellent heat transfer.	Three piece or five piece wedge styles have areas of high clamping force and areas without any clamping pressure. Can cause damage, if over torqued.
Locking/Un-locking Time	1/4 turn.	Multiple turns to obtain proper torque pressure.
Operational Repeatability	Always 1/4 turn lock-unlock. Consistent and easy to operate.	Most wedge styles need a torque wrench. Clamping pressure may vary. Locking torque may vary with lock/unlock cycling.
Over-torque Sensitivity	Not susceptible to over-torquing under normal conditions.	Wedge style retainers begin to lose clamping pressure when over-torqued as the screw bends, then stretches. They may be difficult to remove upon over-torque failure.
Damage During Normal Operation	Very low; ZIF III is very forgiving.	Upon repeated cycling, significant damage may occur to enclosure slots and inconsistent clamping pressure will result.
Mounting Options	Braze or screw thread mounting.	Screw and rivet mounting.
Thermal Performance	1-3 °C/Watt per Inch.	1-5 °C/Watt per Inch.

Table 1. ZIF III vs. Wedge Style Comparison

## Conclusion

ZIF III retainers provide a simplistic quarter-turn lock and uniform clamping pressure. These and other features should be considered for all mission-critical applications.

## Referenced Documents

ZIF III retainers are tested per:

MIL-STD-810  
MIL-E-16400  
MIL-S-901

Complete Details on ZIF III and other ZIF products can be located at:

<http://www.etsalliance.com>

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