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## ELECTROSTATIC DISCHARGE SYSTEM FOR MODULAR SENSOR DEVICE

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# Electrostatic Discharge System for Modular Sensor Device

## Abstract

*The invention is a design for a printed circuit assembly (PCA) retention structure that grounds the PCA without the use of dedicated components, tools to mount the PCA, or a grounding wire. This design was developed for a modular sensor PCA which must be installed and replaced by service technicians in tight spaces that do not accommodate the use of tools. Also, the addition of dedicated components for grounding would have represented a material cost increase and negatively impacted the ability to fit the PCA into the available space. The invention greatly contributes to the long-term robustness and serviceability of the device.*

## Description

This invention helps overcome the difficulty of creating electrostatic discharge (ESD) protection while meeting PCA size constraints, as well as serviceability access limitations. Traditionally electrical grounding for ESD protection is done by either dedicated screw holes on the PCA with pads connected to ground that make contact when the screw is used to fasten the PCA to a grounded chassis, or a grounding strap is connected between the screw and PCA and fastened to chassis ground elsewhere on the machine. Both solutions require a screw hole on the PCA with exposed PCA ground around the hole, as well as the need for a screw driver to replace or service the PCA.

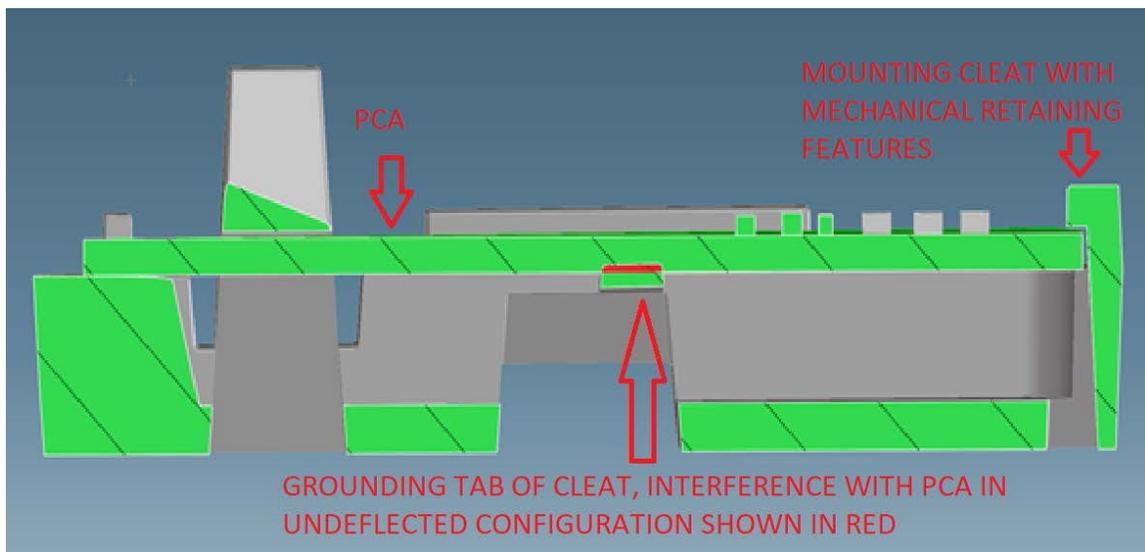


Figure 1

As seen in Figure 1, a complete system for implementing this design consists of a PCA with a small section of exposed ground plane and a conductive mounting cleat. When the PCA is installed, the cleat is secured to the ground plane in a way that feature is deflected and insures consistent contact with the exposed ground layer. Figure 2 shows the tab contacting a ground area in a prototype. In an alternative example, the cleat feature is also used to position and retain the PCA, serving two purposes.

The invention allows the designer to install PCAs in very constrained conditions and reduces need for tools and specialty components related to installing and/replacing the part. This saves cost in PCA size by allowing small PCAs, as well as eliminating screws, ground straps, or other necessary hardware that would traditionally be required. It also saves time and engineering hours when designing in difficult or tight spaces.



Figure 2

***Disclosed by Hannah Haring, David Soriano and Corwin Whitefield, HP Inc.***