

# PCB Mechanical Specifications

This page presents the mechanical specifications for PCB's in the ICE Platform when being integrated by an OEM.

## PCB Dimensions

All PCB's in the ICE Platform follow identical board dimensions and header/mounting hole locations. The PCB's themselves are 4 inches square and contain 4 mounting holes for 4-40 screws on each corner. The dimensions of the boards are shown in [figure 1](#). All contain a power bus header on each side ([Samtec PN: ESQ-106-13-T-D](#)) and a digital communications bus header ([Samtec PN: ESQ-104-13-T-D](#)) in the middle of the PCB. These headers are 0.1 inch pitch board-to-board headers that allow interconnection between boards when stacked, as shown in the [next section](#). At the edge of the board there are copper tabs extending from four IC's (TO-220 package) for heatsinking. Details on proper heatsinking are described in a [later section](#).



Not all circuit boards will utilize all four heatsinking positions and therefore may have copper tabs in only a few positions. The four possible tab positions shown in the drawings will be fixed for every board even though a copper tab may not be utilized there.

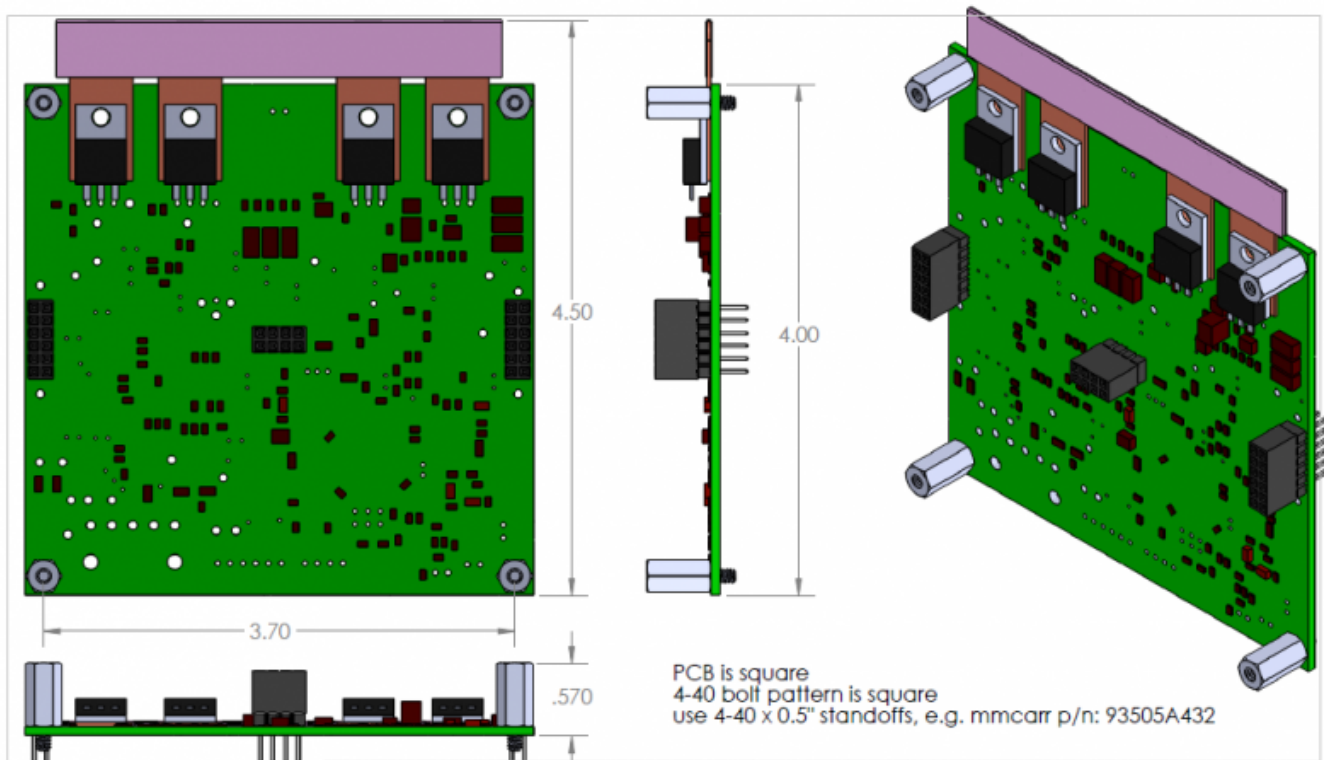
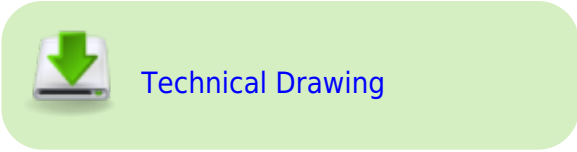
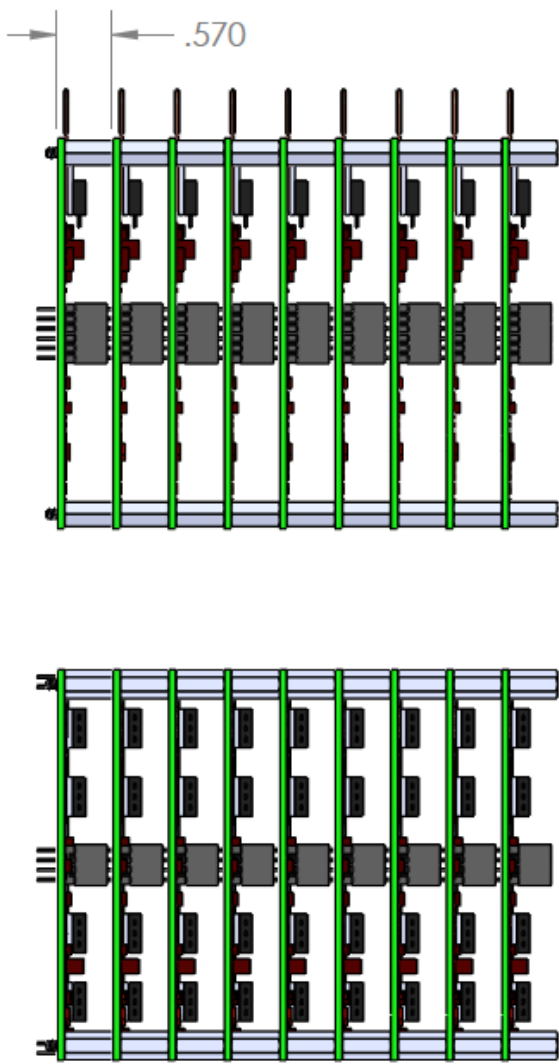


Fig. 1: PCB dimensions.



## PCB Stackup

The PCB's are designed to stack on one another with each of the board-to-board headers mating, thereby forming a power distribution and communications bus between boards. The PCB's can be stacked by using 0.5 inch length 4-40 standoffs (McMaster-Carr PN: 93505A432) between boards in the four mounting holes at the corner as shown in figure 2. The maximum stack height is 9 boards total.



The 'pitch' of the stack, i.e. the thickness of one board plus the standoff is 0.5700"

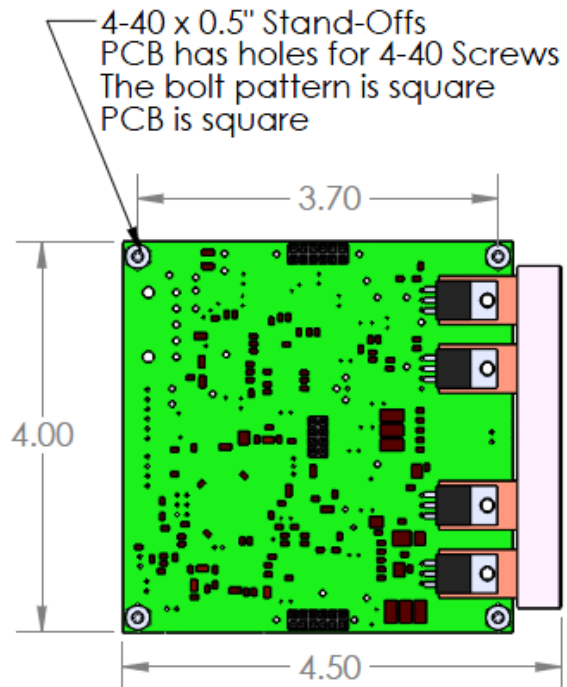
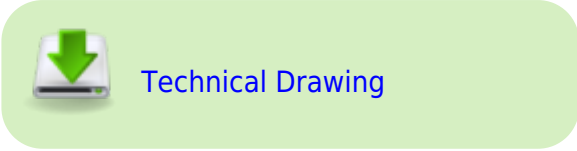



Fig. 2: PCB stacking mechanics.



# Thermal Management

Each PCB exposes up to 4 copper tabs to conduct heat out from power dissipating components to an external heat sink. The copper tabs are not electrically isolated, so electrical isolation is **required** at the interface between the heatsink and copper tab. Failure to isolate these tabs will result in malfunction of the ICE module. For electrical isolation with good thermal conductivity, **Sil-Pad** can be used. Sil-Pad requires a certain amount of pressure to ensure good thermal conductivity, so a clamp mechanism should be applied to the copper tabs. In the **figure 1** and **figure 5**, the Sil-Pad is shown in pink. In the **ICE Platform** enclosure, a wedge-based clamping system is used. The mechanics and dimensions of this are detailed below

 The copper tabs **must** be electrically isolated from the heatsink. For electrical isolation with good thermal conductivity, **Sil-Pad** can be used.

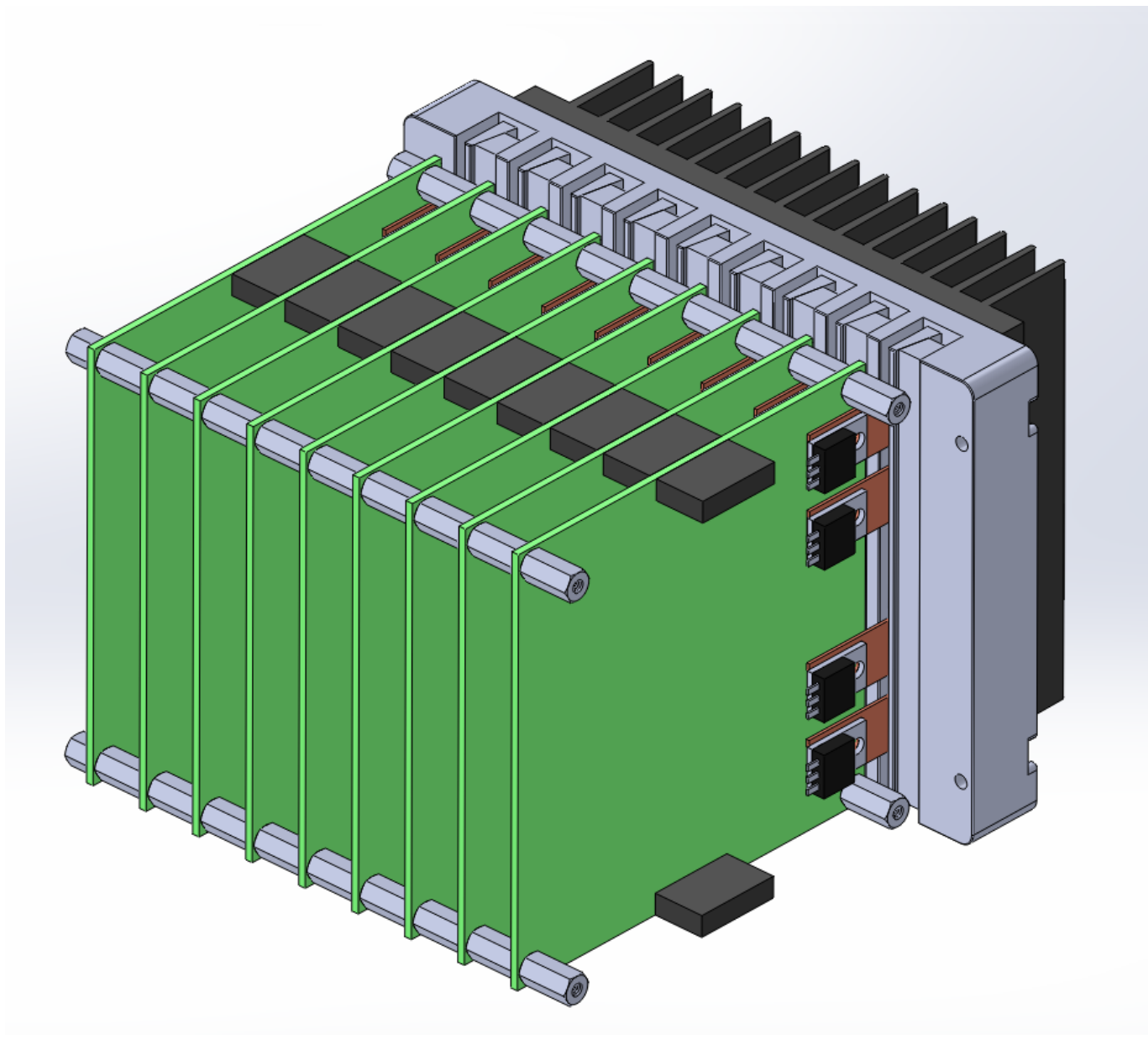


Fig. 3: Overall pcb heatsink stackup.

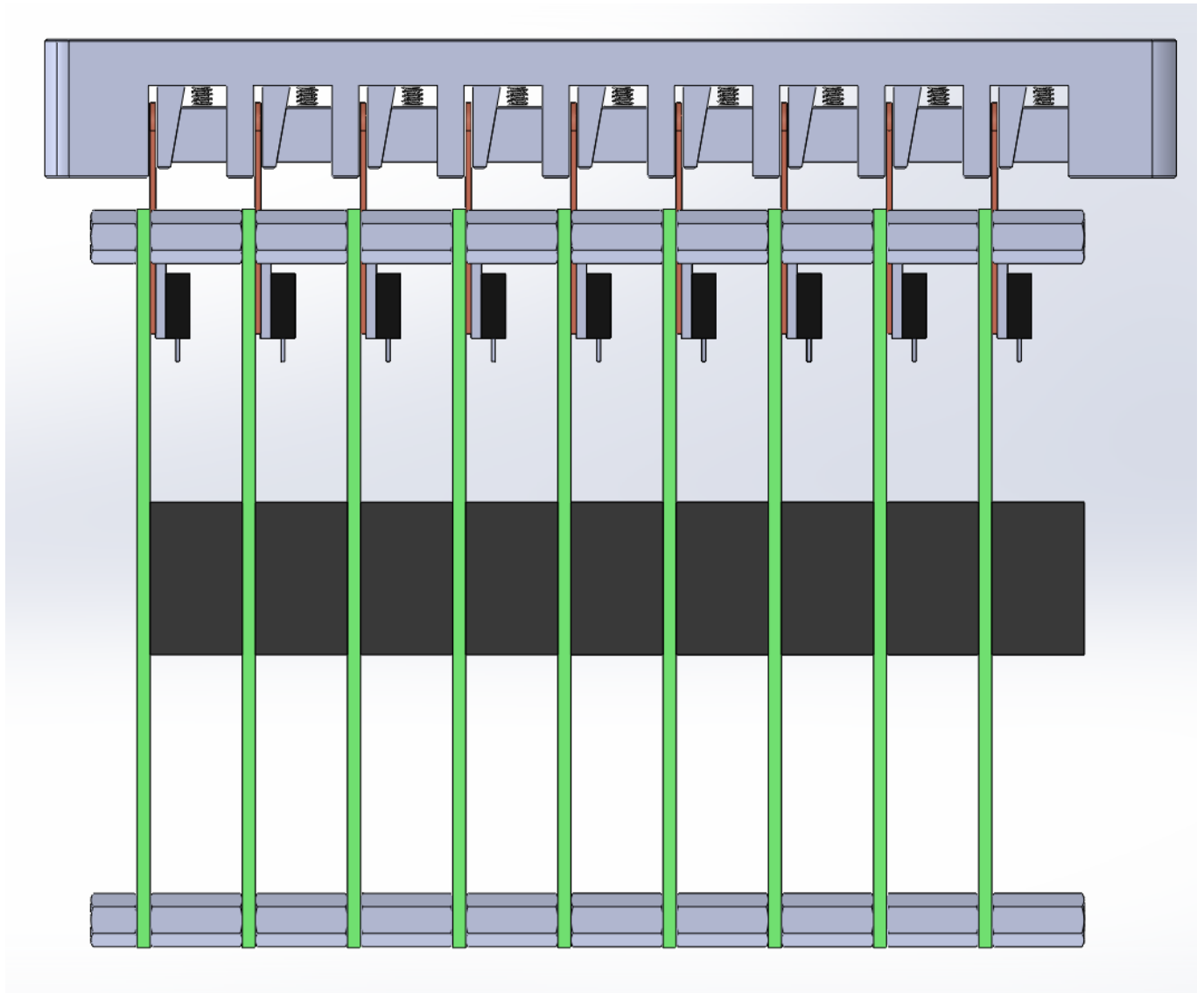


Fig. 4: Top view of the stackup.

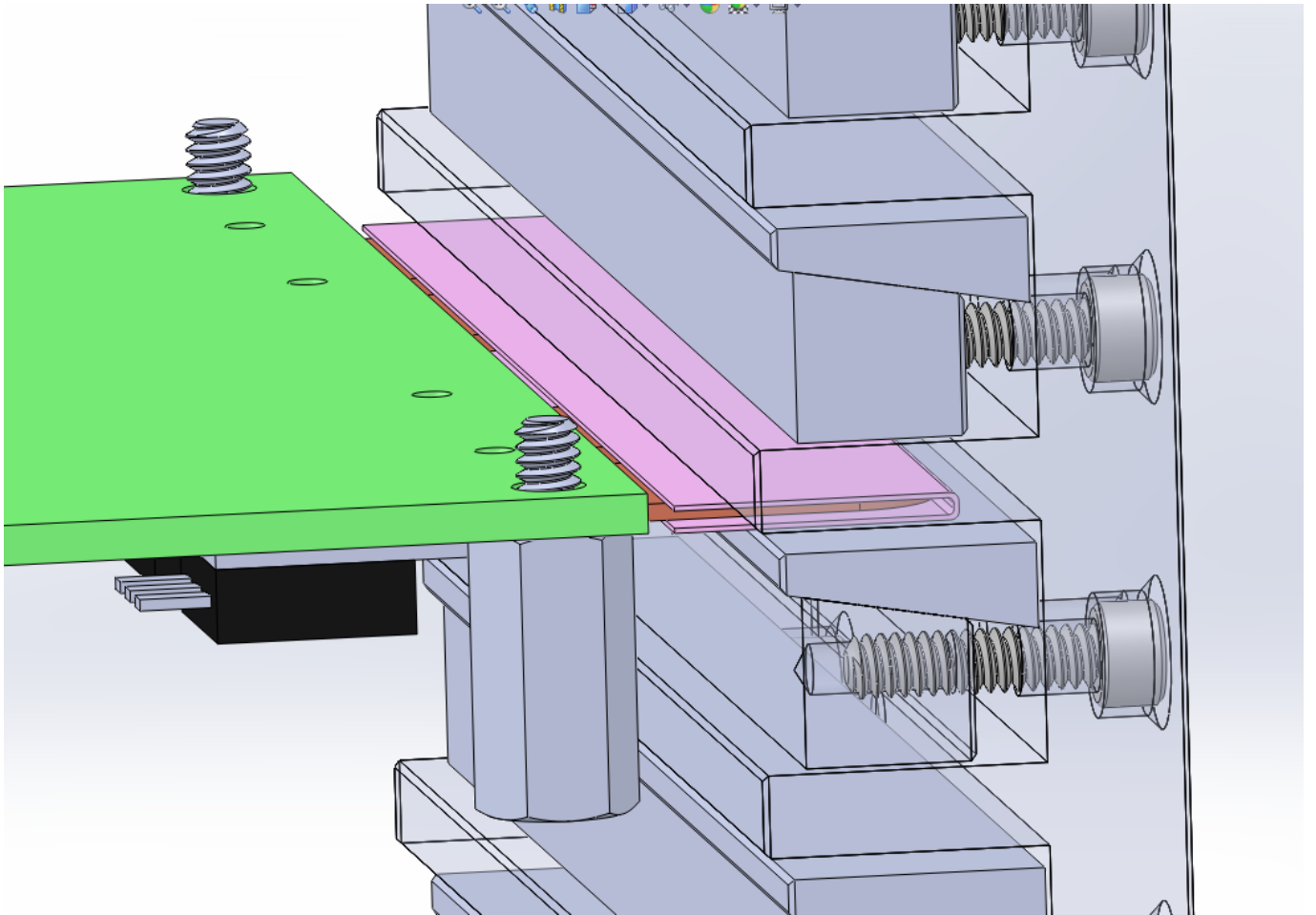



Fig. 5: Detail view of wedge clamp. Pink material is Sil-Pad for electrical isolation.

 [Technical Drawing](#)

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