A NEW BUSBAR EMBEDDED POWER CONVERTER MODULE

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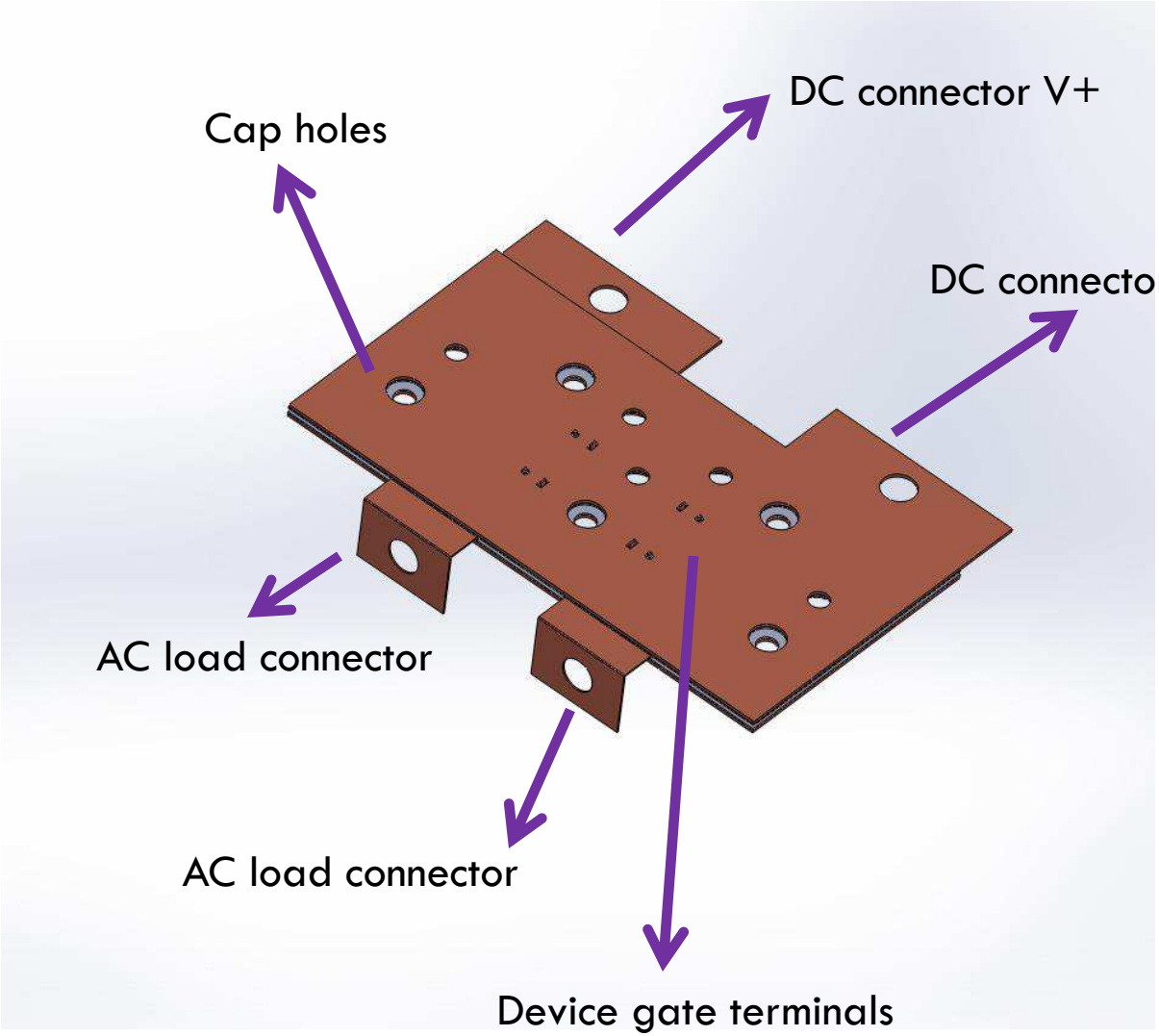
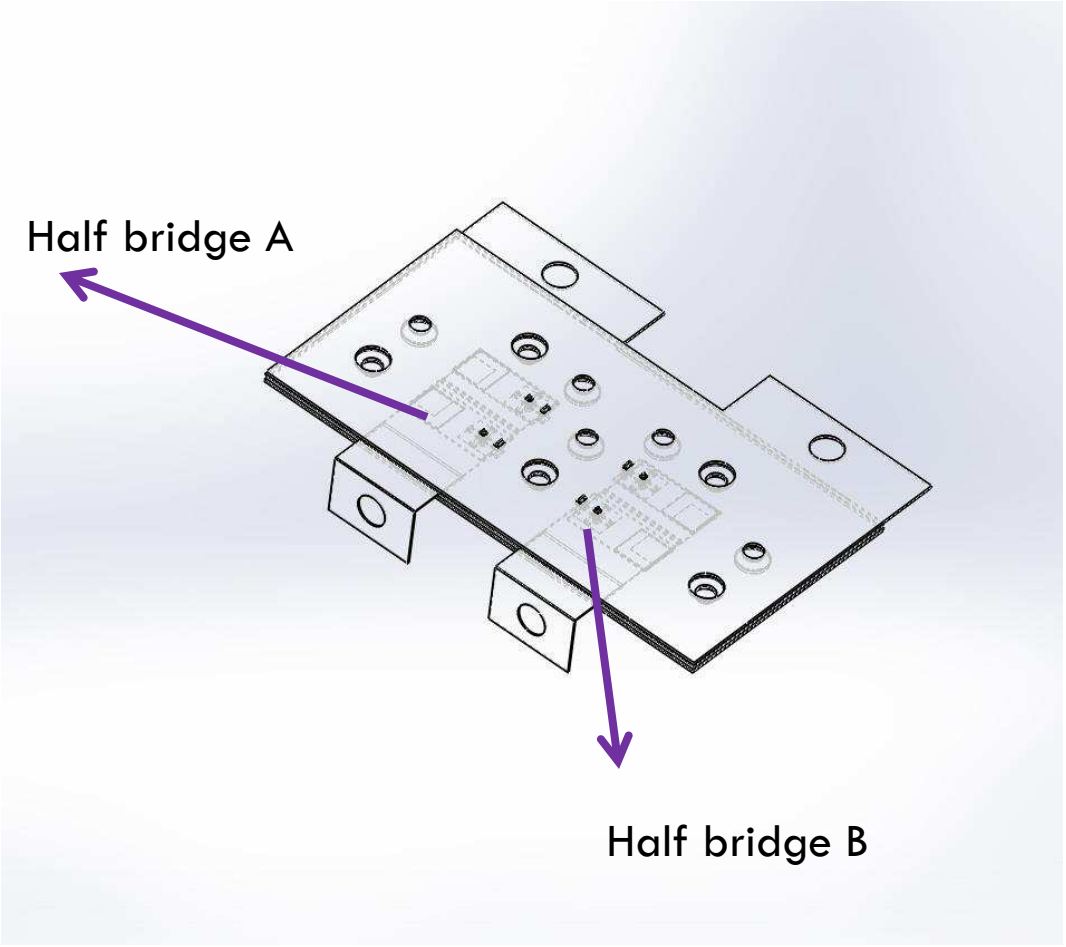
Whole system (top view)

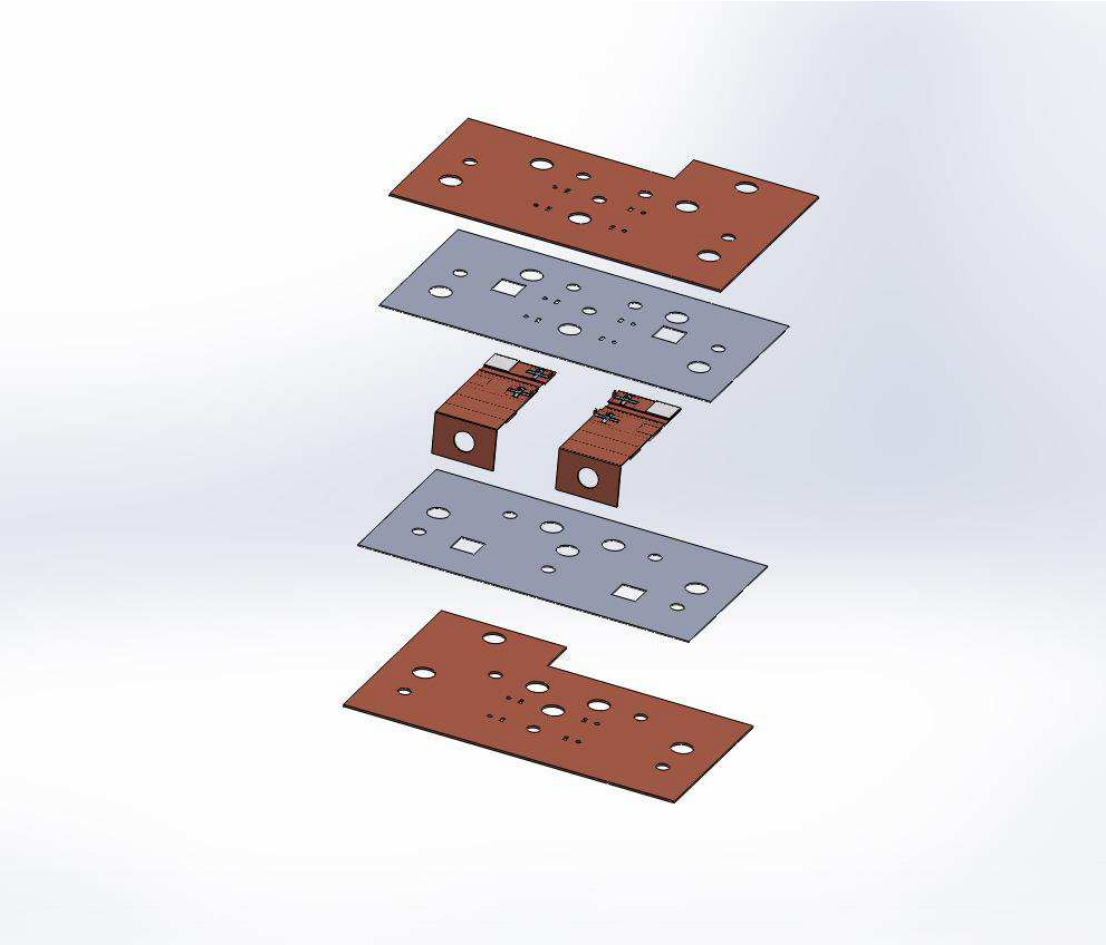


Whole system (bottom view)

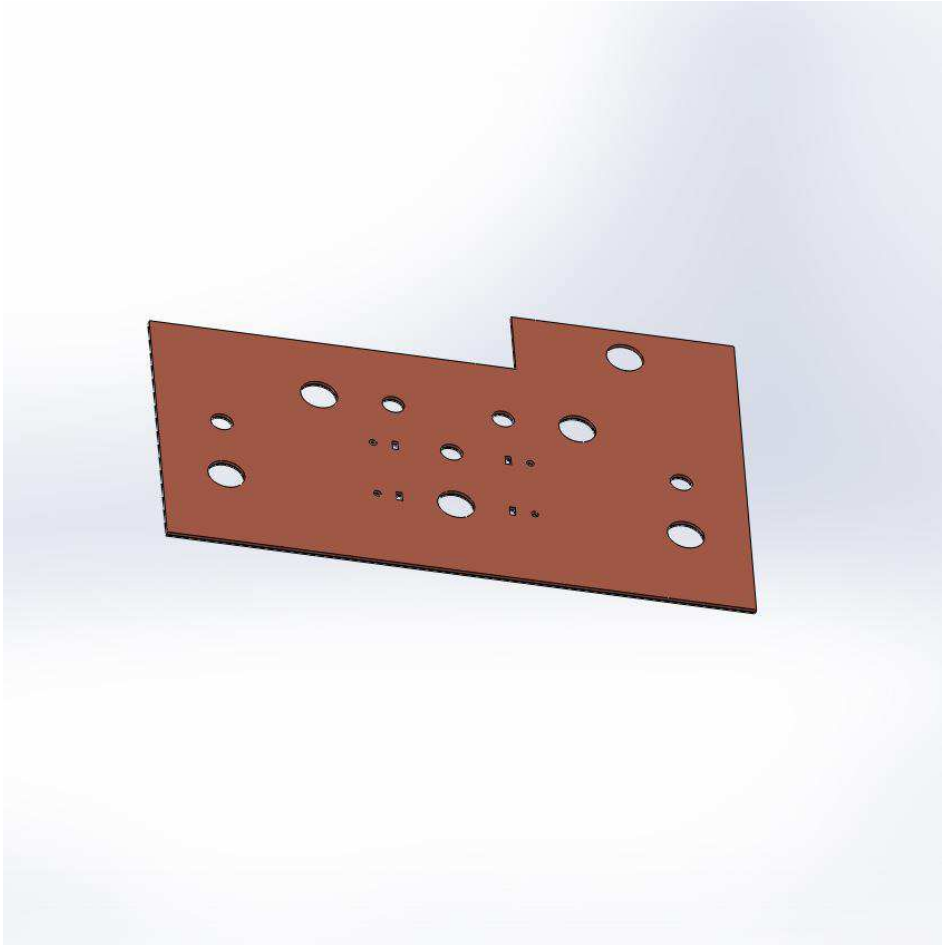
Whole system (transparent view)



System layer structures



Part 1 – Upper Bus (top view)



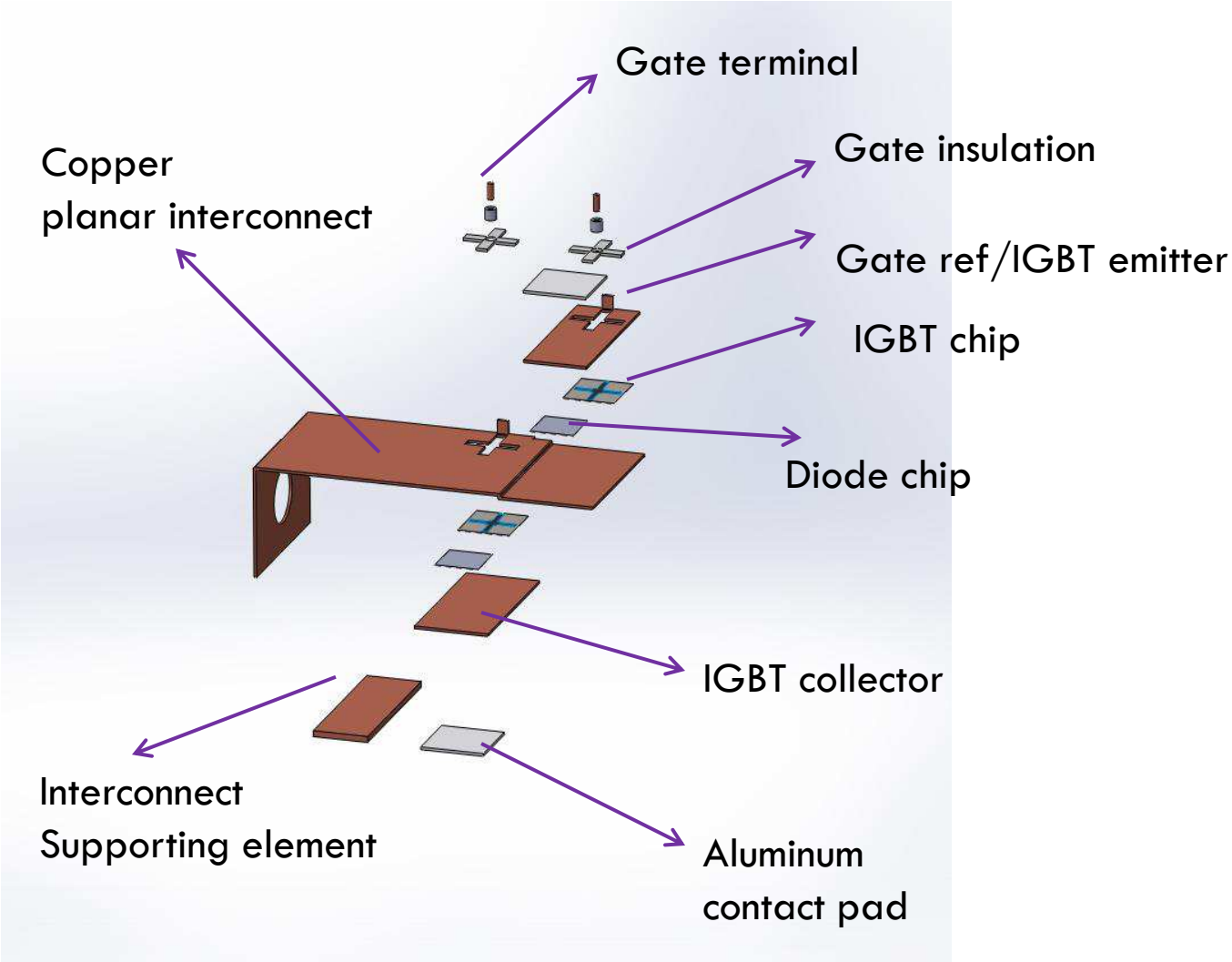
Part 1 – Upper Bus (bottom view)

Fabrication Technology: Traditional DCB

Part2- Bridge Configuration (top view)

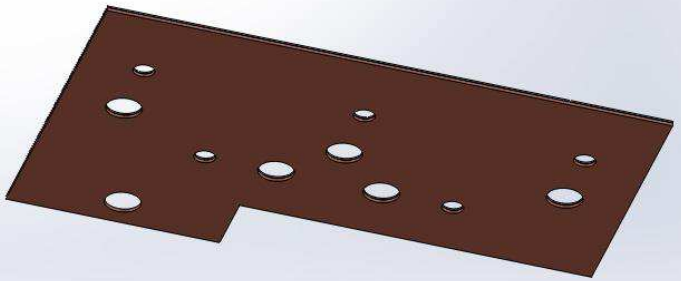
Part2- Bridge Configuration (bottom)

Part2- Bridge Assembly



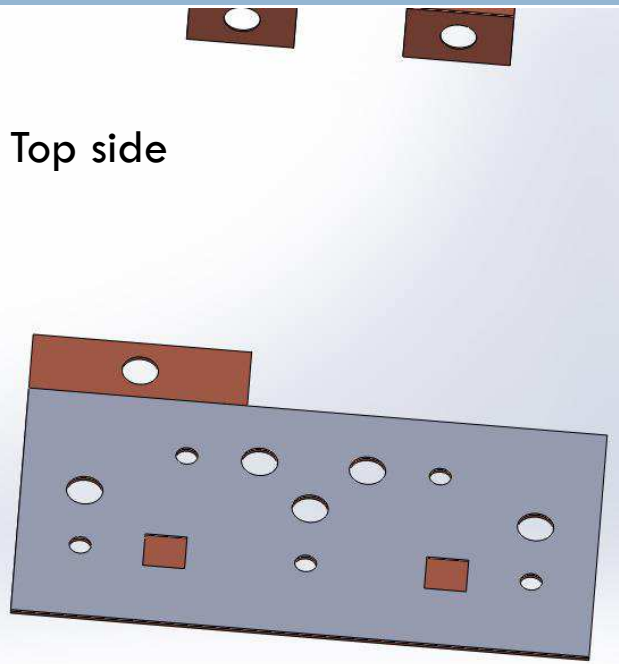
Part3- Lower Bus (V+ bus)

Bottom side



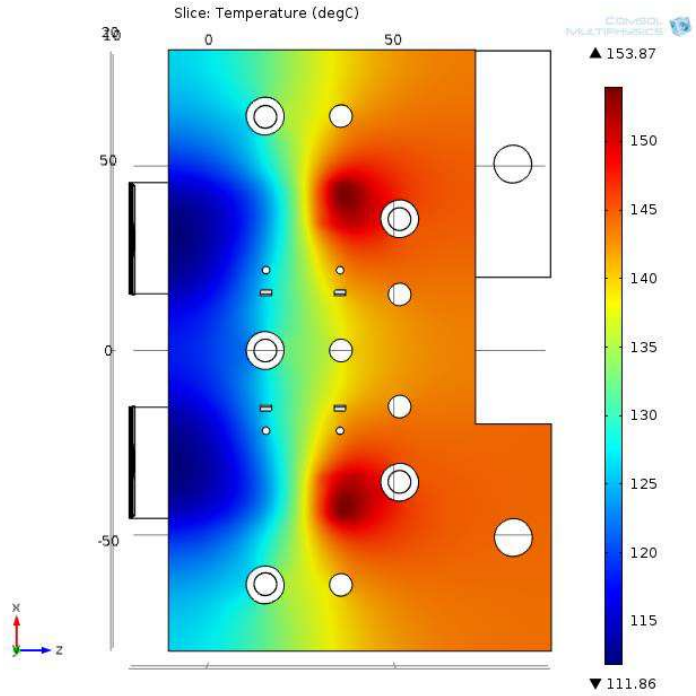
Fabrication Technology: Traditional DCB

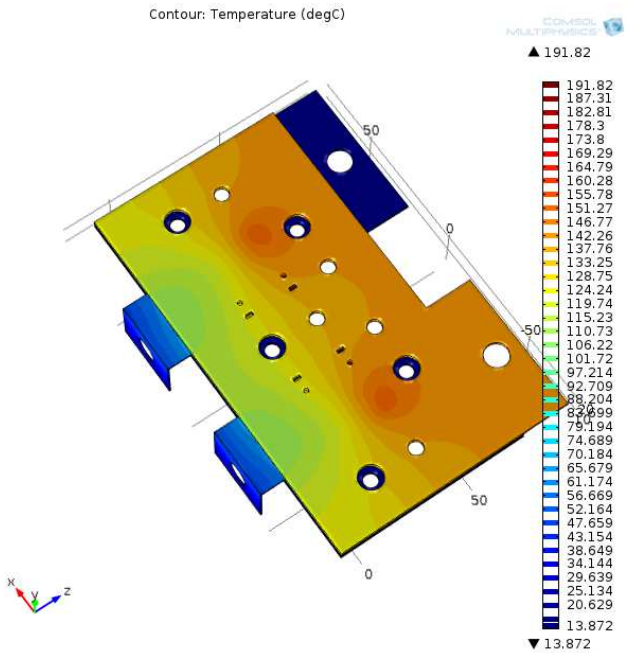
Top side



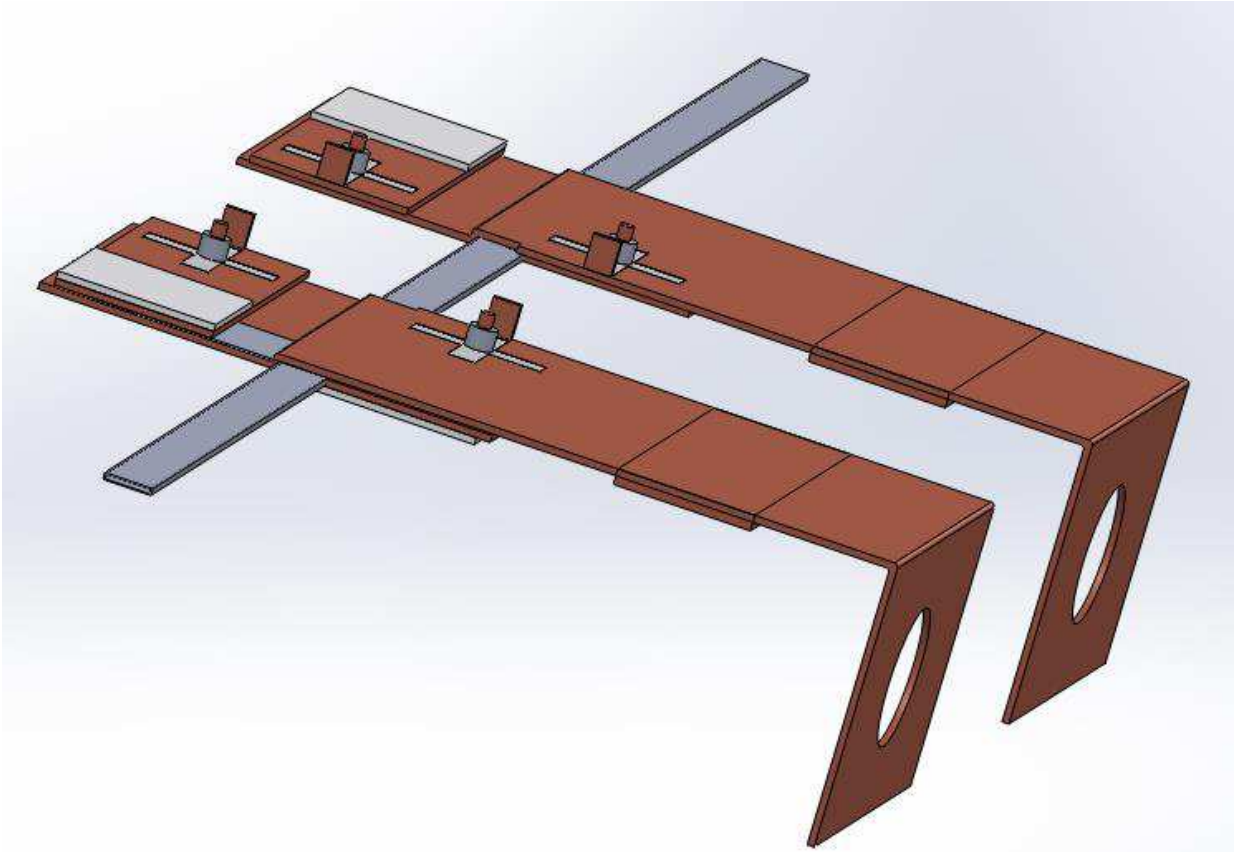
Temperature simulation

- Assume each of the 8 chips (in this conceptual design)has a power dissipation of 50 w, bottom side is fixed to 20 degree C



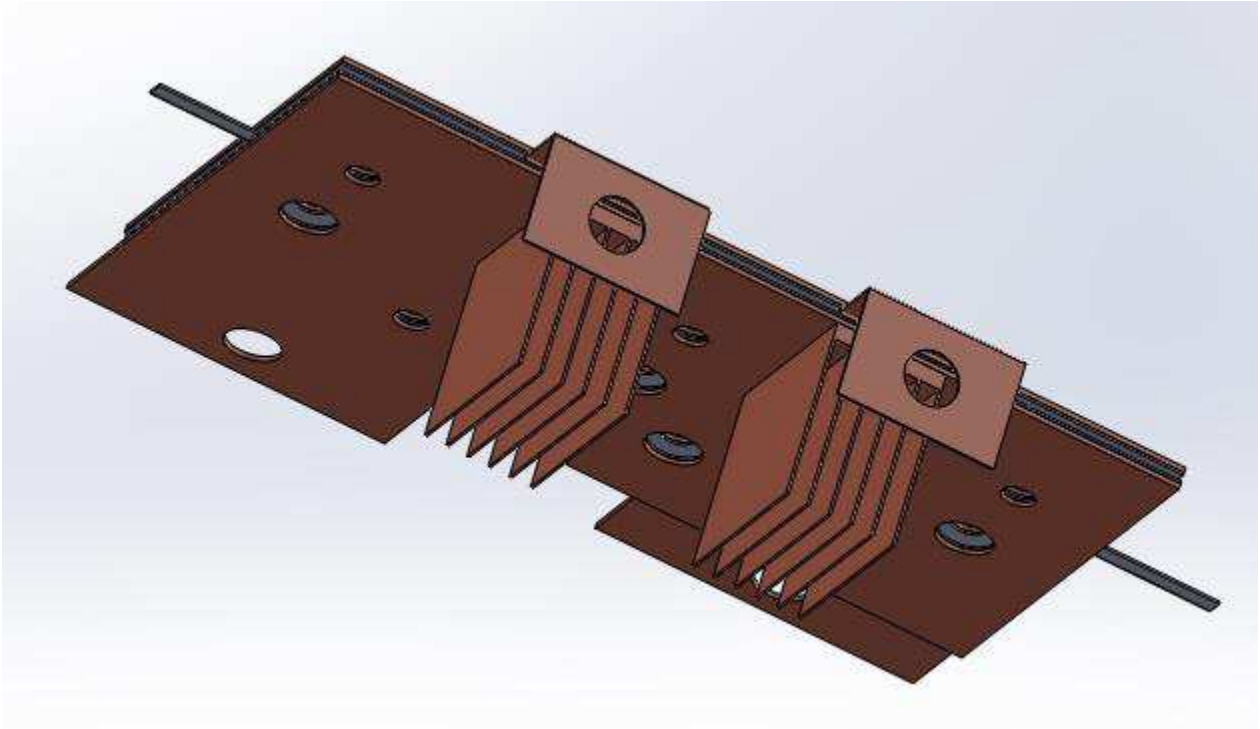


Optional feature-embedded cooling pipe



This is for showing the concept. The real design my have a U shape cooling pipe for each of the half bridge unit.

Optional feature-embedded heat sink



Optional feature-EZ mount

- A press in type of assembly will be used for assembling the system by just pressing the upper and lower bus together.

Other options

- Vertical Gate Drive circuit board in top
- Capacitor on top bus
- Heat sink cover all bottom bus

Summary of feature

- Busbar in module
- Busbar as heatsink
- All planar interconnection
- Embedded cooling element
- Optimized capacitor hole location
- Optimized gate terminal location
- Half bridge unit configuration
- Lower bus(heat sink) electrically hot

Advantages

- Super low interconnect inductance
- Double sided cooling for power device
- Very compact design
- Allow gate drive circuit locate extremely close to power semiconductor device
- Can be fabricated and assembled very easily
- Flexible for deferent topology (single/3 phase VSI)