Open Source Inverter Specification

* Inverter is 48vdc+- to 120vac. 5kW with 100% overload.
* Overload capability will be a function similar to a motor thermal overload. Tjmax <150c in overload. PCB tracks <105c
* A high frequency design will be the goal. This would require a DC-DC converter(s) front end in addition to the basic inverter. Initial design would tend towards a basic low frequency inverter that can drive a 50Hz-60Hz transformer
* Low frequency design is flexible voltage designed to drive many LF transformer ratios. 230v is doable.
* High frequency design would most
* Thermal simulations performed with a crossflow blower seem the likely way to go. A pair of extrusions could be interleaved with converter on one side and inverter on opposite side. One blower would be required to cool both converters.
* Switching frequency at or above 10kHz with possible reduction in carrier frequency in overload condition
* Output Inverter transistors would be TO-247 style. Silicon Mosfets look to be the best choice with 2 on each corner.
* Input DC-DC converter most likely resonant switched open loop Push-Pull design. Two parallel input series output converters with 1:1 transformer may prove best design. Voltage doubler design would provide 1:4 voltage boost.
* DC-DC converters may use toroidal and/or planar transformer sets.
* Topology would be plug-in control boards with 4layer 6oz copper power boards
* Units will be parallel capable with 240v or 120-0-120 volt split phase operation.
* Output frequency selectable 50Hz/60Hz
* On board EMI filters at both input and output.
* Digital display with operation parameters and fault annunciation.
* Auto-restart capable in event of fault.
* Integrated fuse TBD
* Cost target is always zero. We see how close we can get.
* Size target is 250mm x 400mm x 150mm for high frequency design
* No built in chargers of any kind. MPPT chargers are a dime a dozen and a PFC design would complicate and slow effort.
* PCB designs in Altium. Other packages as well.
* Thermal modeling is Sauna
* Spice modeling is LT Spice.
* Tenor autem omnino documentum Inverter will be provided.