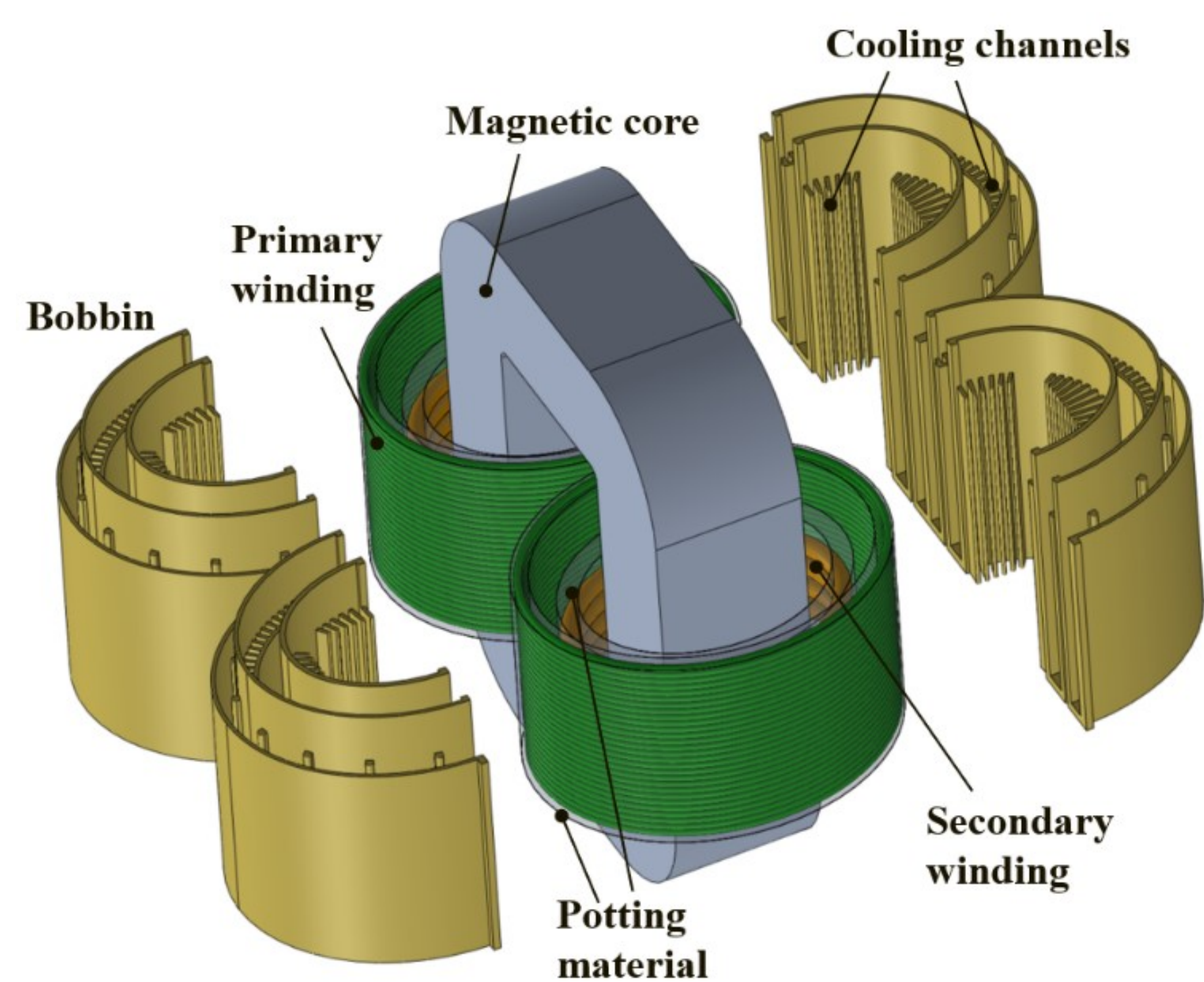


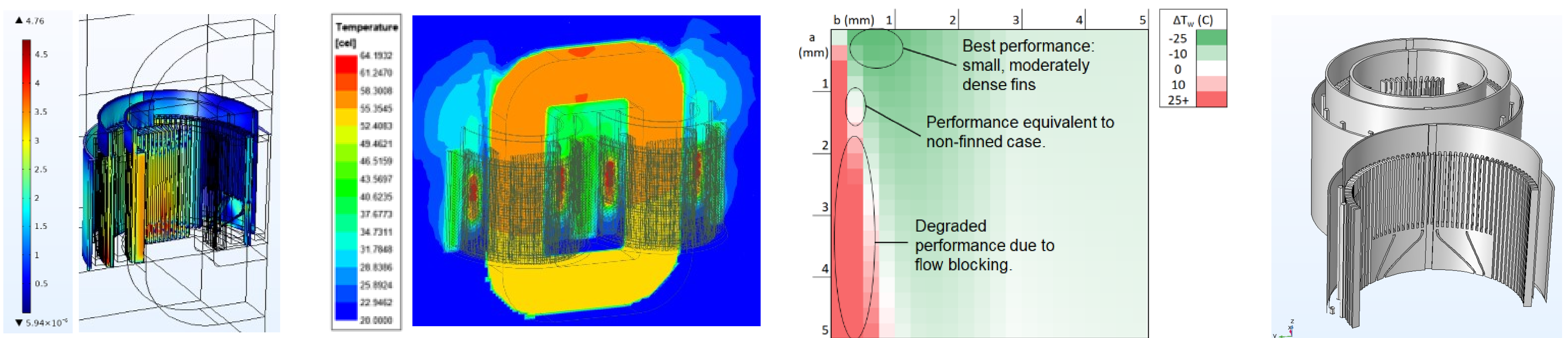
A Novel High Insulation 100 kW Medium Frequency Transformer

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A novel insulation and cooling structure with potted windings is developed in a 100 kW MFT with two FINEMET® FT-3TL magnetic cores and parallel-concentric winding structure. For the first time, a 3D printed bobbin with heatsink fins is demonstrated. The 100 kW MFT achieves a power density of 10.6 kW/L and a partial discharge inception voltage (PDIV) of 20 kV peak.

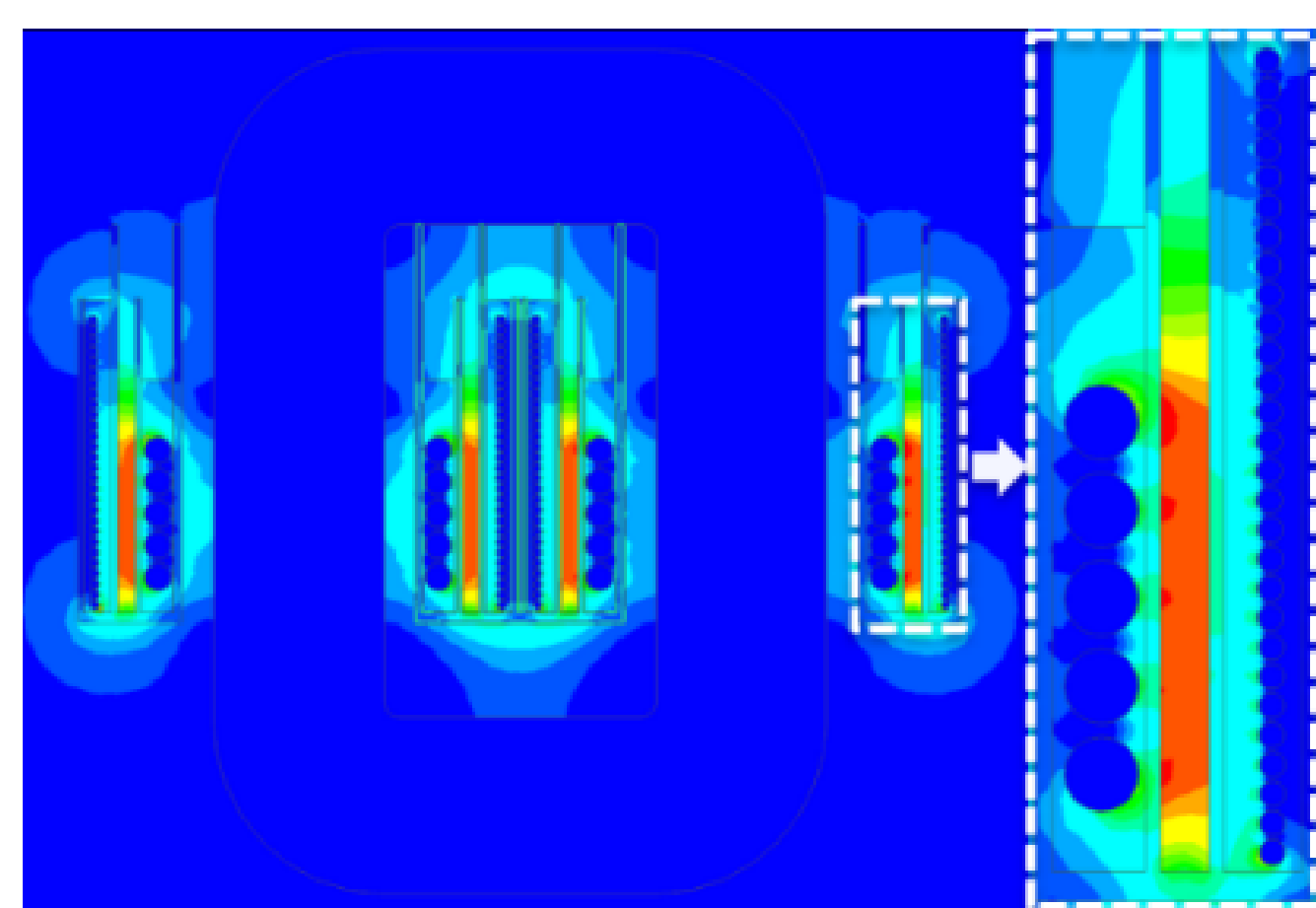
Cooling-Optimal Heatsink Fins Integrated 3D Printing Cooling Structure



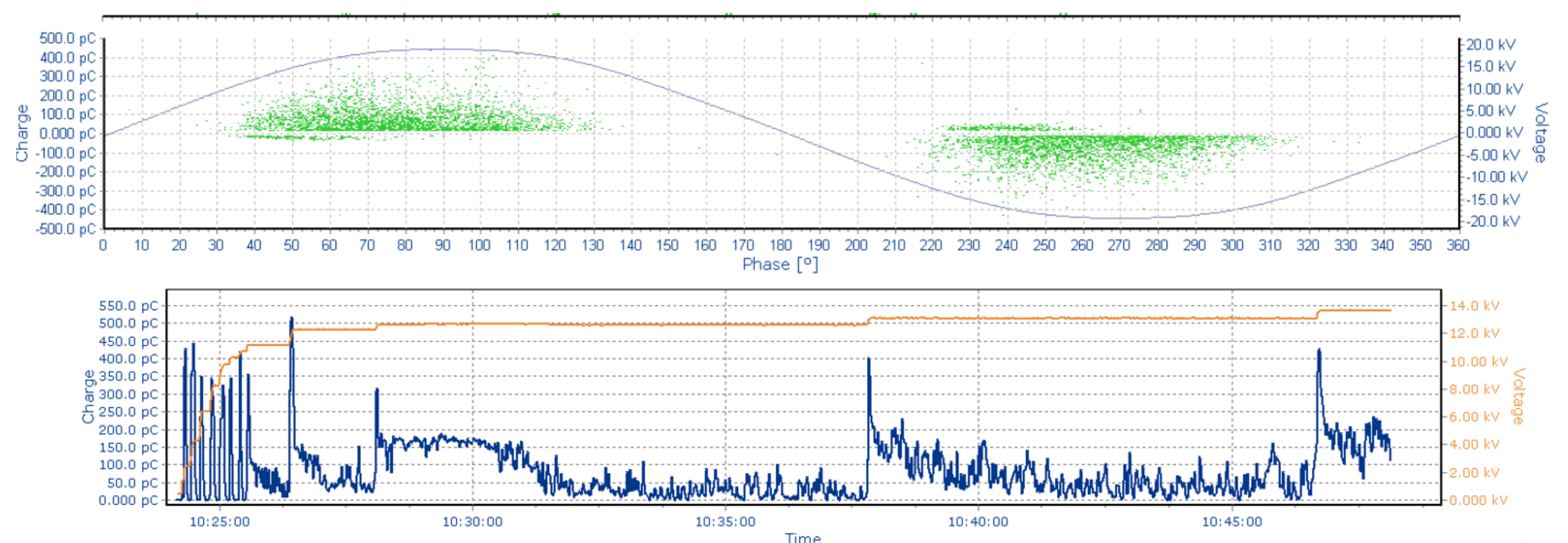
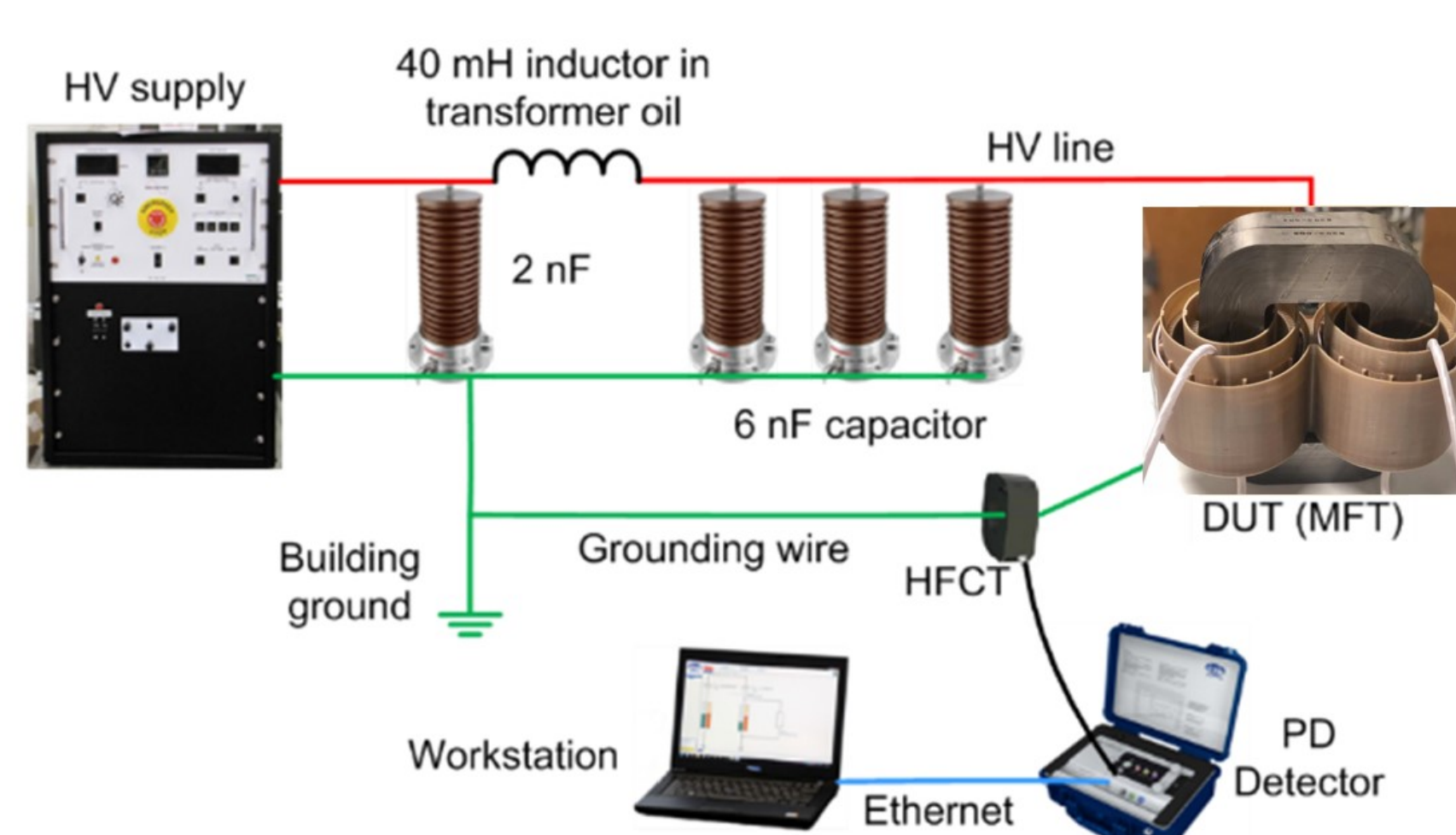
❖ 3D FEM thermal MFT simulation

❖ Geometry parameters optimization map

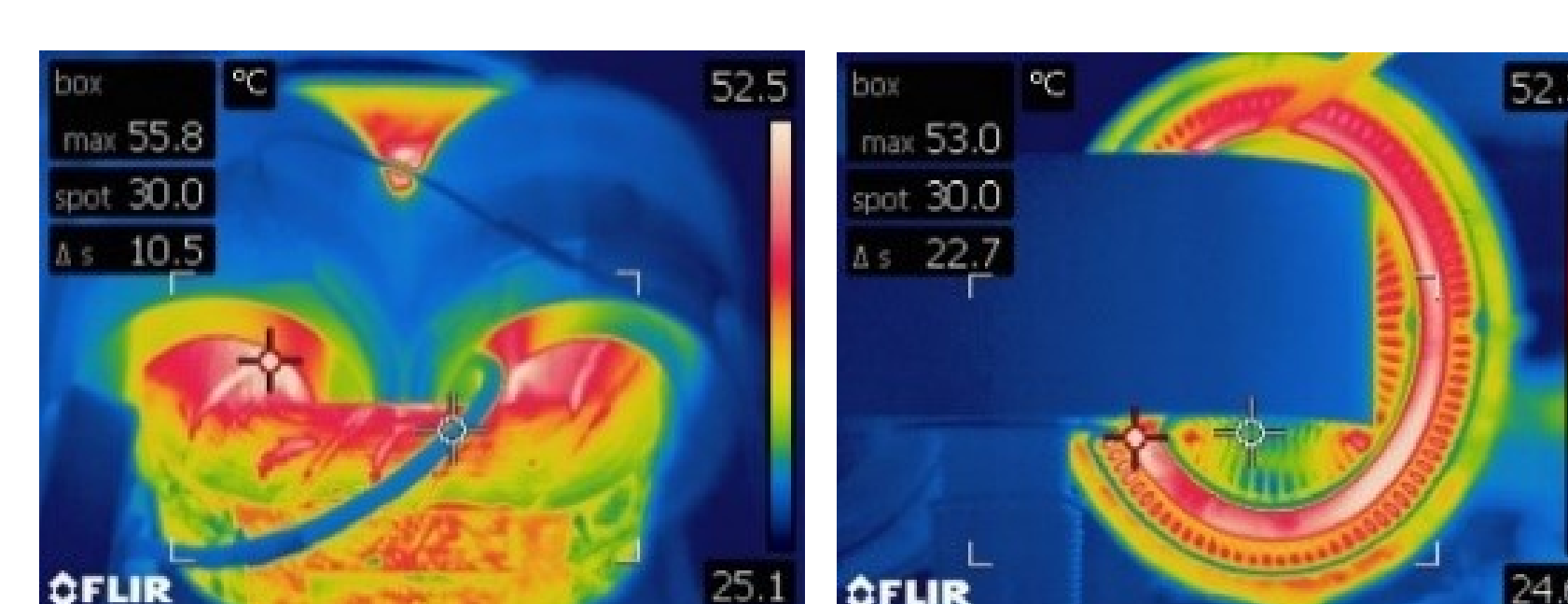
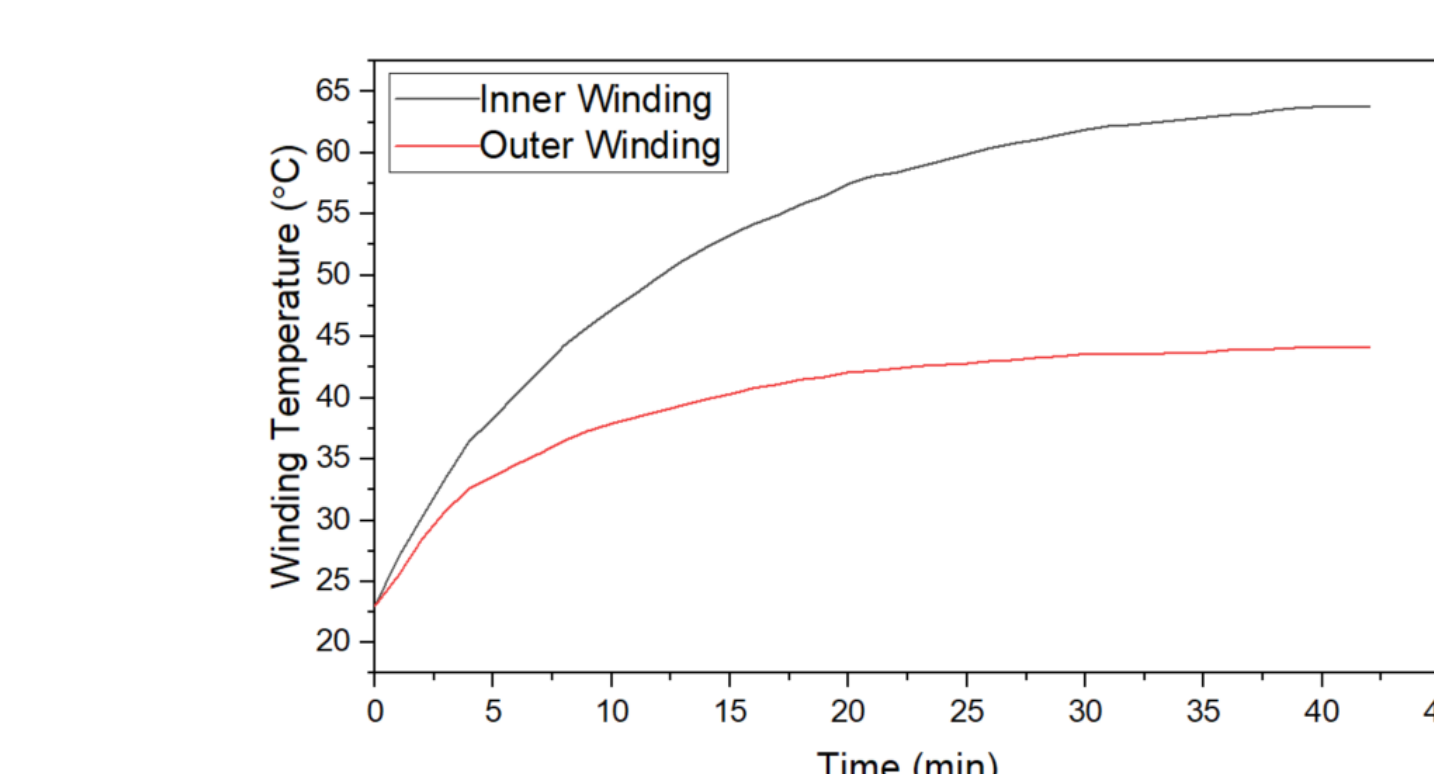
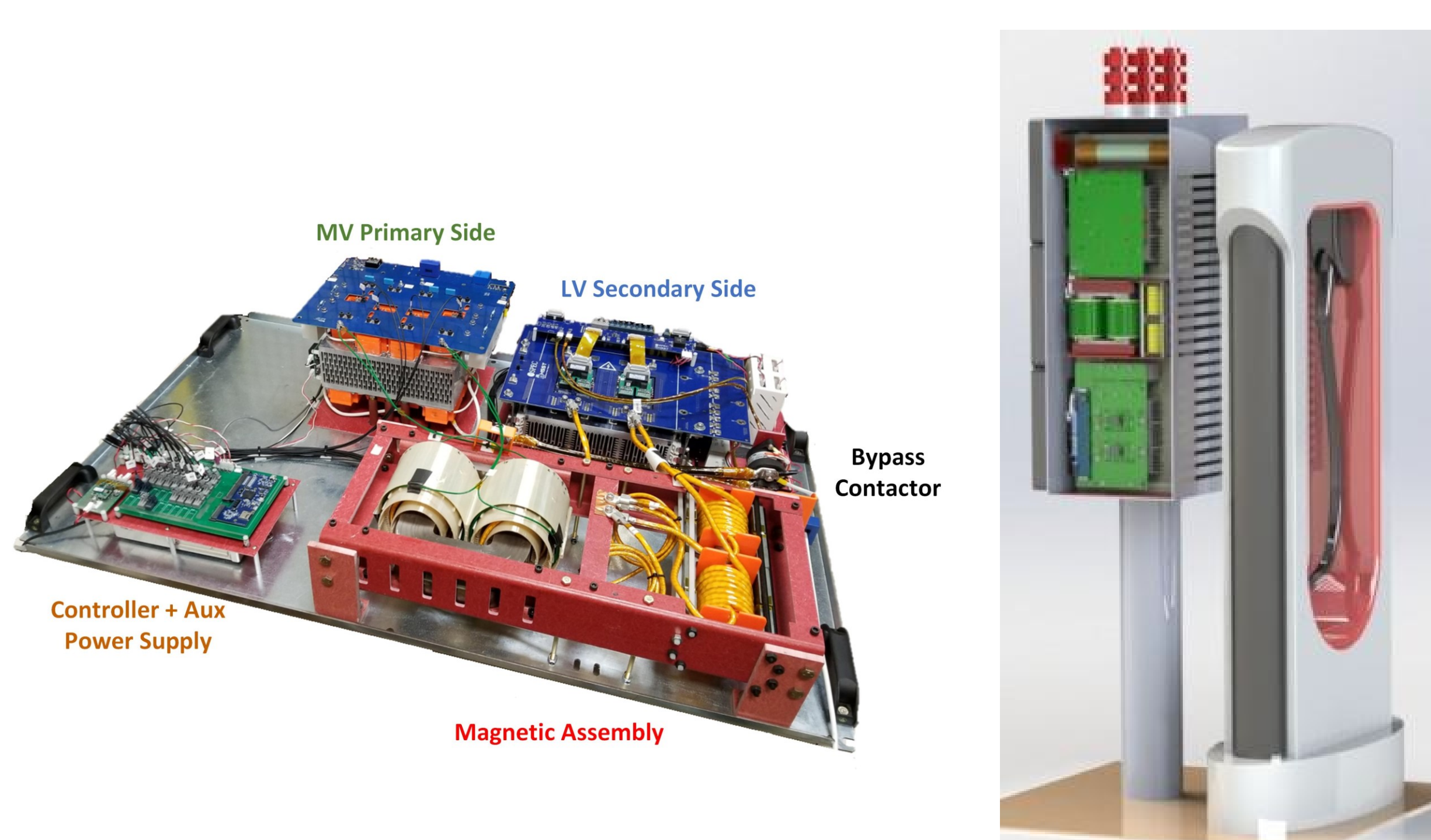
Insulation-Windings Potted Design Achieving 20 kV PDIV



Potting material and insulation distance are well selected to maximum the partial discharge free insulation voltage.



MFT Prototype & Experimental Results



Assembled DABSST and EV fast charger is developed with the proposed MFT. The MFT achieves 99.74 % efficiency at 100 kW with superior thermal performance.