

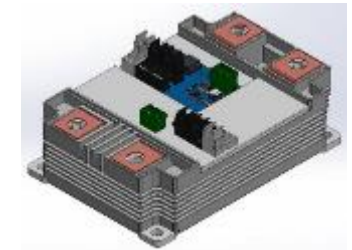
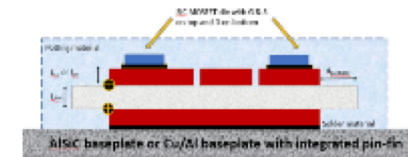
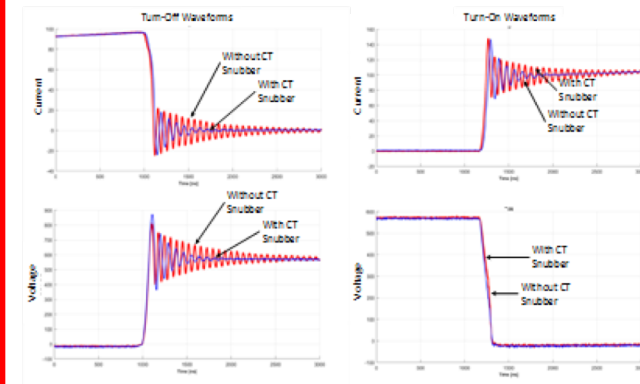
**Project Title:** Removing Customer Concerns to Support Industry Adoption of Medium Voltage SiC Power Modules

**Objectives:** The MV products proposed herein have strong commercialization opportunities within the specified core PowerAmerica module strategy: 1) exploit the positive attributes of WBG devices with low thermal impedance, low inductance, and high temperature capable power modules; 2) module evaluation kit development (including busbar assemblies and gate drives with fast short circuit and/or dV/dt protection); and 3) promote insertion of newly developed high-voltage modules into MV applications through critical EMI/EMC work with the University of Alabama.

Task No. BP5-3.1

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## WBG Technology Impact

1. Increased volumetric or gravimetric density; increased efficiency via reduced conduction loss and reduced switching loss (e.g., ~10% of Si IGBT) in MV power electronic systems
2. Increased operating temperature vs. Si IGBTs ( $T_{vj,op} = 175\text{ °C}$  vs.  $150\text{ °C}$ )
3. Rail traction; rail auxiliary converters; ultra-fast EV charger stations; PV inverters, UPSs, flexible substations/SSTs
4. Commercialization of first MV module platform: ~ C Sample; June 2020
5. Less total losses over the range 5% to 100% of rated load

## Accomplishments/Outcomes

1. WBG MFG Cost is reduced as device & module volumes start to approach economy of scale. Ease of Use is key component of adoption.
2. Job creation for technical R&D / MFG / Process Control personnel, as well as University education and outreach.
3. Proposed Publications, App Notes, & Reference Designs are focused on WBG module/system design education for WBG industry development of all levels; supplemented through development of supporting module circuit simulation models.
4. Supports Supply Chain Development for the ONLY vertically-integrated WBG supplier.