Power Electronics Discussion Summary
Interest: EDT Lab – Supplier Collaboration

- Determine value proposition for national laboratories & industry suppliers
- Define specific activities:
  - Near-term: OEM concerns for bringing WBG technology to production
  - Long-term activities (i.e. packaging for EMF solutions)
- National laboratories bring neutrality
- System integration has to be done by OEMs
  - Lessons learned at the laboratories can help incorporate new techniques
  - Component ➔ Inverter ➔ System development requires a lot more work beyond the laboratory research

Power Electronics Discussion Summary
Market Drivers

- Electric vehicles are coming and it is real (might not be with GM, Ford, or FCA but will be with someone [i.e., Tesla, Apple, Atieva, NextEV, Faraday Future)
- Vehicle global platform at OEM level requires 500,000 unit production (order of magnitude higher volume than in the past)
- Need competition to drive the costs down and develop supply base
- Military market relies on suppliers for introduction of new technology
- Need to shorten technology development to market introduction timeframe

Power Electronics Discussion Summary
Need: Framework for 2025 Targets

- 2020 production is already designed
- Cost (2025 R&D: $210) and basic requirements for 100 kW inverter
  - Requirements for component engineering
    - Set of basic inverter requirements (i.e., capacitor size, maximum junction temperature, ripple current, size, and operating environment)
    - A single page high level component requirements document
  - Cost model detail at a component level
  - Supplier feedback needed – interactive/living requirements document
  - Time for SiC advanced integrated power module (AIPM) development?
- AEC testing for performance & reliability verification (driving to failure [10 yrs, 300,000 miles – autonomous cars]), but not for specific design

Power Electronics Discussion Summary
Collaboration Challenges

- Suppliers need to see potential downstream revenue to invest in R&D
- It is hard to sell something new – focus is on the near term revenue
- Do not want to stray to far from industrial standards and processes
- OEMs can not guarantee business (it is all about price and delivery), but can set the targets and provide input on supplier selection
- Design details are OEM's competitive advantage
  - Single page of requirements will not be detailed enough to develop a common component; however, the intent is to prove out the technology
- OEMs have proven suppliers that they work with and share information with (specifications do not go to everyone)