

Case Study

Research and Development in Silicon Carbide (SiC) Power Electronics

CUSTOMER: U.S. Navy
CONTRACT #: N00014-07-M-0346
PROJECT NAME: SBIR/STTR Project, "High-Power Compact Power Electronics for Electric Torpedoes"
PROJECT DURATION: 2007-2008

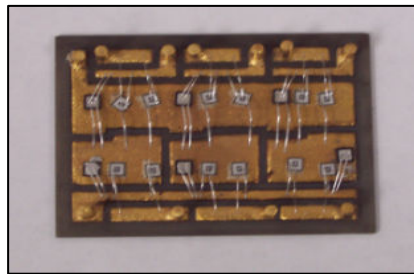
OVERVIEW

The US Navy solicited a SBIR/STTR request for proposal (RFP) for the design and development of DC-to-AC power inverters for use in electric torpedoes and underwater vehicles. These power inverters are used for various applications. The resultant SiC based inverter was capable of operation at high power densities, high temperatures, and high frequencies. In addition, the inverter had high efficiency, was small in size, and light in weight. Aegis Technology was awarded the project in 2007 and successfully completed the project in 2008.

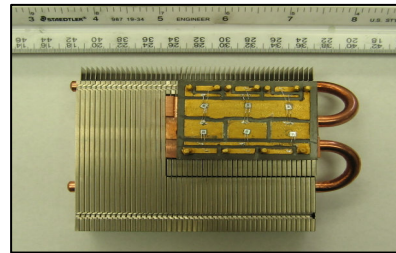
DELIVERABLES

Aegis Technology designed and delivered a 5 kVA DC-to-AC SiC prototype inverter. In the process, Aegis Technology developed and/or conducted:

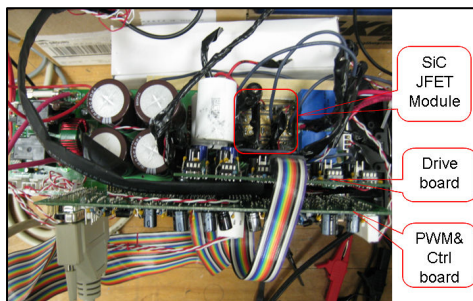
- System level & Circuit level design
- Computer modeling and simulation
- Layout
- Power modules
- Heatsinks
- Ancillary circuits and systems including gate drivers
- Complete integration of inverter prototypes
- Measurements & Testing



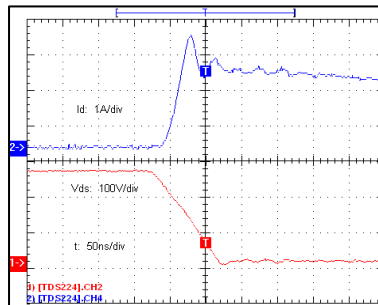
(a)



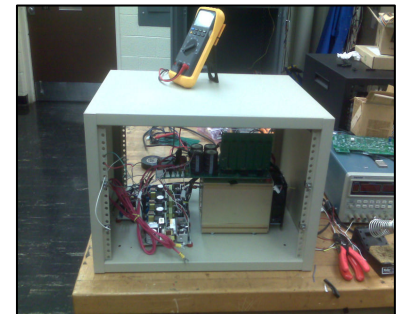
(b)



(c)



(d)



(e)

(a) 3-Phase, 6-Pack SiC Power Module, (b) Heatsink, (c) Close-Up view of SiC DC-AC Inverter, (d) SiC JFET Turn-On & Turn-Off Measured Waveforms, (e) SiC DC-DC Inverter in case

CONTACT

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