

Case Study Research and Development in Silicon Carbide (SiC) Packaging

CUSTOMER: U.S. Department of Energy (DoE)
CONTRACT #: DE-FG02-08ER85186
PROJECT NAME: SBIR Project, "Advanced High Temperature Packaging Scheme with Nonwire-bond Interconnection for SiC Power Switches"
PROJECT DURATION: 2008-2009

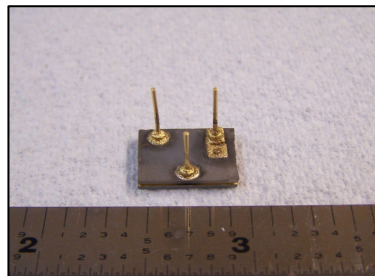
OVERVIEW

The US Department of Energy solicited a SBIR/STTR request for proposal (RFP) for new process techniques for the packaging of SiC power switches, which must operate at high temperatures. Traditional packaging involves the use of Al-wire bonding which fails under high performance and high temperature applications. Based on years of experience, Aegis Technology developed a novel process known as "Parallel Plate Direct Area Bonding" (PPDAB), which eliminates traditional wire bonding. This new method offers improved mechanical, electrical, and thermal performance and reliability over conventional packaging. Aegis Technology was awarded the project in 2008 and successfully completed the project in 2009.

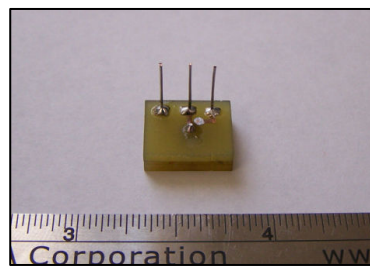
DELIVERABLES

Aegis Technology designed and delivered several prototypes of packaged SiC switches and SiC diodes, and a prototype SiC inverter using PPDAB. In the process, Aegis Technology conducted and/or developed:

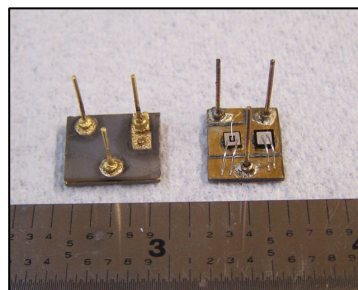
- System level design
- Layout
- Processing
- Oscilloscope measurements
- Testing
- Computer modeling and simulation



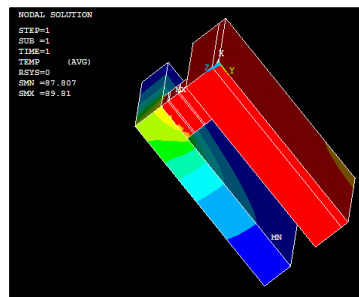
(a)



(b)



(c)



(d)

(a) PPDAB process for SiC switches using AlN substrate,
(b) PPDAB process using PCB substrate, (c) Comparison of PPDAB process to conventional Al-wire bonding,
(d) Computer modeling of PPDAB process

CONTACT

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