

Power Packaging Lab



One International Plaza • Suite 600
Philadelphia, Pennsylvania 19113
Ph: (610) 326-1200 • Fax (610) 326-1290

www.aciusa.org
www.empf.org



The goals of the Power electronics lab are to develop manufacturing capabilities in assembly technology that can exploit the advantages of advanced materials. Furthermore, the laboratory will transfer advanced manufacturing technologies to military and commercial vendors who will deliver advanced electronics and power system to future US Navy surface ship platforms. The lab contains equipment which enables flip chip assembly, hybrid bonding, wirebonding, and hermetic packaging of electronics devices, and surface mount chips and components. In addition the lab has capability and equipment to support thermal analysis, and electrical characterization testing at the wafer and device level. The combination of characterization and assembly, coupled with design and simulation capability, will shorten

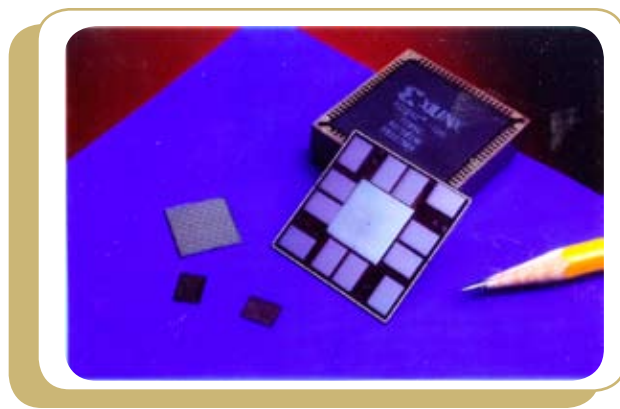
the time between discovery and deployment of advanced power and electronics systems for use on Navy Ships.

The facility will benefit future US Navy surface ship platforms by developing capabilities and solutions for the following:

- Electronic packaging for high power semiconductors
- High temperature wire bonding materials and techniques
- High temperature die attach materials and techniques
- Near-hermetic high temperature housing materials, die coatings, and encapsulates
- Simulations and models for mechanical, electrical, RF, thermal, and thermo-fluid designs

continued





- Shorter R&D cycles for RF devices, systems in a package (SiP), and power semiconductor packages and materials
 - Packaging for high thermal conductivity materials, such as adhesives, thermal paste, thermal heat spreaders, heat sinks, and die attach solders for junction temperatures greater than 200°C
 - More affordable commercial packaging solutions for up to 200°C operation, high current density packages and modules, high frequency packages and modules, and high voltage packages and modules.
- The power electronics assembly and packaging laboratory will be a proof-of-concept facility that employs analytical techniques, such as acoustic microscopy, fluorescence illumination, field emission scanning electron microscopy, and liquid crystal analysis. The Navy will benefit from such analyses by gaining the ability to evaluate new technologies like advanced substrates, die attach materials, and wire bond materials.