



Sandia National Laboratories & Wireless Integrated Microsystems (WIMS)

The WIMS academic research at the University of Michigan is consistent with Sandia's research and development roadmap and together Sandia and the University of Michigan work for the further development of wireless integrated microsystems. Sandia is currently serving on the WIMS industry board of advisors and helps to determine technical direction.

Driven by our national security mission systems which often include radars and wireless communication, Sandia has developed strengths in:

- high density RF BCB-Cu substrates with embedded passives,
- high speed digital ICs including SiGe development,
- mixed signal IC design and fabrication,
- high efficiency (>80%) RF power amps,
- GaN high power transistors and MMICs,
- passive RF wake up circuits,
- radar responsive long range TAGs
- passive medium range TAGs and sensors
- SAW correlator based miniature communication links
- 60 GHz satellite links



A main thrust at Sandia is to reduce existing RF systems by a factor of five in volume by (1) replacing RF functions with high speed, highly integrated ICs, (2) reducing inefficiency and size of power management, (3) using BCB-Cu substrates with embedded passives, (4) developing miniature integrated filters, and (5) streamlining architecture based on improved components.

One facility Sandia utilizes in the further development of wireless microsystems is the Compound Semiconductor Research Lab (CSRL). CSRL capabilities are among the most extensive of any laboratory of its kind in the world and allow for rapid prototyping and low-volume production of novel microanalytical and microsensor systems. The CSRL fills an intermediate niche in the research to development to applications technology cycle. It is heavily weighted towards development, but with strong and crucial overlaps in research.

Another facility used in the further development of wireless Microsystems is the Microelectronics Development Laboratory (MDL). The MDL is a silicon fabrication facility that produces radiation-hardened CMOS integrated circuits and microelectronic and micro-electro-mechanical systems. There is over 180,000 square feet of laboratory space consisting of a diverse and complete tool set that supports microelectronics initiatives in failure analysis, reliability, test, modeling and simulation, advanced packaging, radiation hardness assurance, device design, and silicon device fabrication.

Sandia is a national security laboratory involved in a variety of research and development programs to help secure a peaceful and free world through technology. We develop technologies to sustain, modernize, and protect our nuclear arsenal, prevent the spread of weapons of mass destruction, defend against terrorism, protect our national infrastructures, ensure stable energy and water supplies, and provide new capabilities to our armed forces. Our primary sponsors are the Department of Energy's National Nuclear Security Administration, the Department of Defense, and the Department of Homeland Security. We also work with other government agencies, industry, and academic institutions to accomplish our mission. Sandia has facilities in Albuquerque, New Mexico; Livermore, California; Tonopah, Nevada; and Kauai, Hawaii and has almost 10,900 employees.



Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

