AME GEM

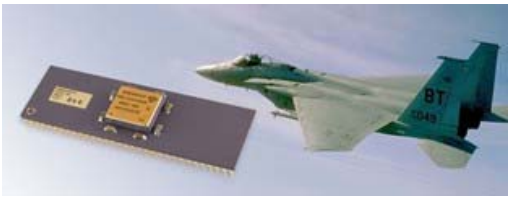
SRI International®

On-shore, Trusted Microcircuit Design and Manufacturing

The Generalized Emulation of Microcircuits (GEM) program, Defense Logistics Agency (DLA), DLA Land and Maritime, and SRI International (Princeton), offer a flexible technology that can be utilized during any phase of a weapon system's life cycle. The program delivers a permanent solution to microcircuit obsolescence at the component or board level while reducing total ownership cost and maintaining readiness.

In the late 1980's, DLA recognized that microcircuit obsolescence threatened the readiness of many American defense systems. Numerous systems in the armed forces were designed and developed in the 1960's and 1970's.

For example, the U.S. Air Force began flying the F-15 Eagle tactical fighter in 1972, and the U.S. Navy first tested the Aegis phased-array radar at sea in 1973. Because of continued advancements in semiconductor technology, the original suppliers stopped manufacturing the micro-electronic components used in these and other systems.



In 1987, DLA contracted with SRI to begin research and development on how to best replace obsolete microcircuits with standardized, modern integrated circuits (IC). In collaboration with DLA and DLA Land and Maritime, SRI developed the GEM program. Using its onsite Trusted semiconductor foundry, established computer-aided design software, and deep knowledge of IC design and development, SRI produces on-demand, Class Q microcircuits matching the form, fit, function, and interface (F3I) criteria of the required microcircuit. To further alleviate growing IC obsolescence issues caused by the continued rapid advancements in technology, DLA is developing the next generation of F3I microcircuit emulation capability through the Advanced Microcircuit Emulation (AME) program. The new capabilities developed by AME are utilized by the GEM program to ensure the emulation programs continue to meet weapon systems wide-ranging requirements.

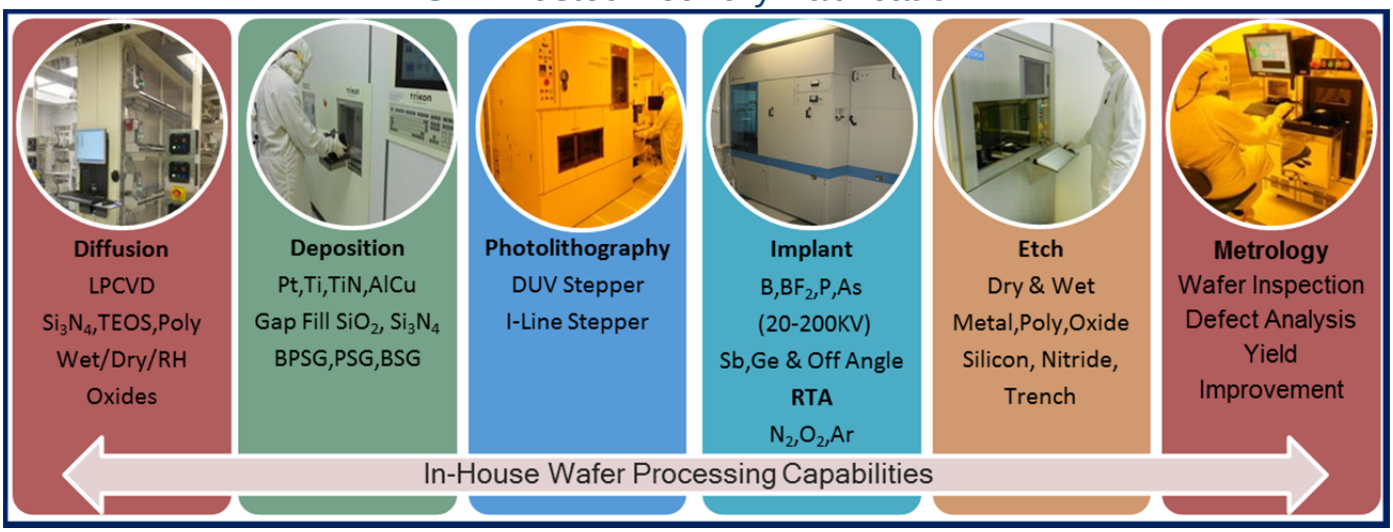
SRI's semiconductor foundry is accredited as a Department of Defense (DoD) Trusted Foundry supplier and provides a stable manufacturing source for over 20,000 part numbers. GEM microcircuits currently support more than 375 unique weapon systems including the F-15, F-22, AEGIS, Phalanx, and Bradley Fighting Vehicle.

Contact us today for your free bill of material (BOM) analysis at geminfo@sri.com or visit our website www.gemes.com

Microcircuit Emulation Processes

Technology Node	3.0µm	1.5µm	1.2µm	0.8µm	0.50µm	0.35µm
	BICMOS HV CMOS	CMOS BICMOS HV CMOS	CMOS BICMOS	CMOS Bipolar DTI	CMOS SOI (DTI Schottky)	CMOS (Development)
Vdd	5V, 20V	5V, 100V	5V	5V	5V	3.3V, 5.0V
Metal Levels	2	2	2	3	5	6

SRI Trusted Foundry Fabrication

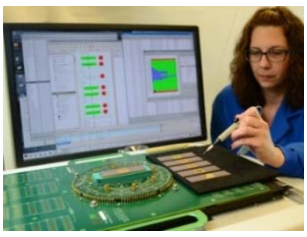


SRI's Microcircuit Emulation Wafer foundry occupies 25,000 square feet at the Princeton campus. The foundry is trusted and Qualified Manufacturers List (QML) certified. The Wafer Fab has ISO 4 (Class 10) and ISO 5 (Class 100) cleanrooms. The facility operates a two shift operation Monday through Friday and uses the MESA WIP tracking system which enables real time wafer lot tracking and historical record retrieval. Statistical Process Control is implemented in all key process areas and out of control action plans are followed as appropriate. Fully documented procedures and training records are the basis of audited certifications for all staff. SRI maintains all process equipment with vendor trained staff and service contracts where appropriate.

Emulation Circuit Design

Our in-house design center uses a suite of modern Computer-Aided Design (CAD) tools covering all aspects of chip integration and reliability. Working closely with our co-located Trusted foundry and advanced TCAD tools to analyze the fabrication process enables the unique capability for SRI to meet our customers' requirements. Our digital design capability covers a range of technologies (CMOS, BiCMOS, Bipolar) and feature sizes, from 3.0 µm down to 0.35 µm. Our current development thrust is to add a High Voltage Analog capability.

QML Test and Screening



SRI maintains in-house capability to perform the vast majority of qualification and screening tests with DLA issued lab suitability in conformance to the requirements for military grade microcircuits (MIL-STD-883). In addition to high performance digital ATE (up to 200Mb/sec and 416 pins with a vector depth of 8M) over the mil spec temperature range (-55°C to +125°C) and parametric and functional wafer probing, the installed test and screening equipment provides the ability to perform: temperature cycling; constant acceleration; high temperature burn-in; helium leak test; ESD sensitivity classification; marking permanency; lead solderability; physical dimensions; thermal shock; mechanical shock; vibration; salt atmosphere; and lead finish adhesion. These tests are routinely performed in the qualification and production of emulated GEM microcircuits.

SRI International®
201 Washington Road | Princeton, NJ 08540
609-734-2812 | geminfo@sri.com | www.sri.com | www.gemes.com