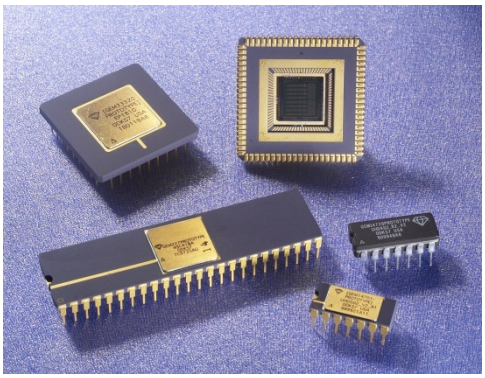
AME GEM

SRI International®

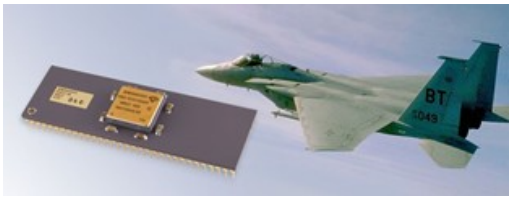
Solving Your Microcircuit Obsolescence for Over 25 Years!

Through the Generalized Emulation of Microcircuits (GEM) program, Defense Logistics Agency (DLA), DLA Land and Maritime, and SRI International (Princeton), formerly Sarnoff Corporation, offer a flexible technology that can be utilized during any phase of a weapon system 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 levels.



In the late 1980s, 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 attack 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.

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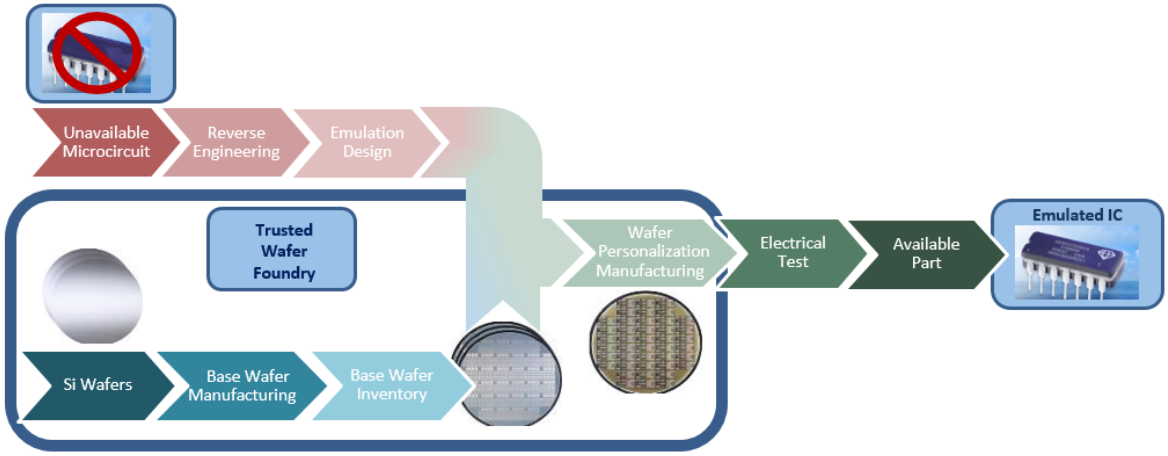
Microcircuit Emulation Process



Unavailable Microcircuit

When a request for an obsolete IC is received, the SRI designers review the microcircuit specification. The designers then select a suitable SRI process technology and design array that will allow a form, fit, function microcircuit emulation to be manufactured.

Reverse Engineering

Design data obtained from data books, slash sheets, source control drawings, and the original equipment manufacturer (OEM) are often incomplete and require detailed verification. Therefore, data are captured from known good samples of the obsolete IC using both electrical characterization and physical reverse engineering processes. The result of this analysis is an Emulation Design Specification which contains the original microcircuit specifications, and clarifies any errors, ambiguities or critical omissions in the original documentation.

Looking for a permanent solution to your microcircuit obsolescence?

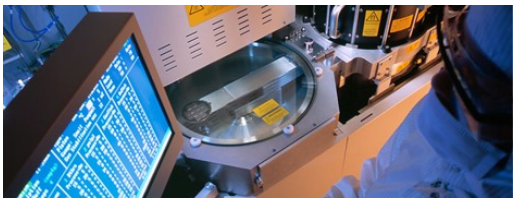
SRI is your trusted source.

Emulation Circuit Design

Design and circuit verification tasks are performed using a suite of modern computer-aided design (CAD) tools. SRI designers begin the design process by simulating the logic and circuit networks to predict their functionality and electrical performance. These logic and circuit configurations are then rendered into geometric design (the "layout"). The physical effects of the layout on logic and circuit networks are evaluated to ensure the resulting microcircuit achieves desired function and performance.

Trusted Foundry Fabrication

Once the design is complete, the part can be manufactured in our in-house, U.S.-based, DMEA-certified Trusted wafer foundry. SRI has developed a split manufacturing process, in which wafer lots are processed through the majority of the manufacturing flow and held in inventory. For each new design, a single wafer can be processed through the final stages to create the required part. This on-demand manufacturing process allows SRI to significantly reduce the time to manufacture the required part.



Electrical Test (QML)

The wafers are tested to verify that the wafer process parameters and the individual circuit characteristics conform to performance and reliability requirements. Die meeting these requirements are mounted into the appropriate package, wire bonded, and hermetically sealed by QML-qualified U.S.-based assembly contractors. The assembled parts are then individually tested over the full temperature and performance range and verified to meet all requirements of the specification. Screening of package integrity, life-test reliability, and the full complement of reliability tests are performed in accordance with SRI's qualified manufacturer's list (QML) certification and the requirements of MIL-PRF-38535.

Available Part

All emulated parts are fully traceable and delivered with a certificate of conformance in compliance to customer procurement requirements.

Emulation technology can be applied to replace a single IC, to replace multiple ICs with a single device, redefine the function and capabilities of an existing board, or even to combine the function of multiple boards into a single IC.

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