ViArray
Trusted Rad-Hard Structured ASIC

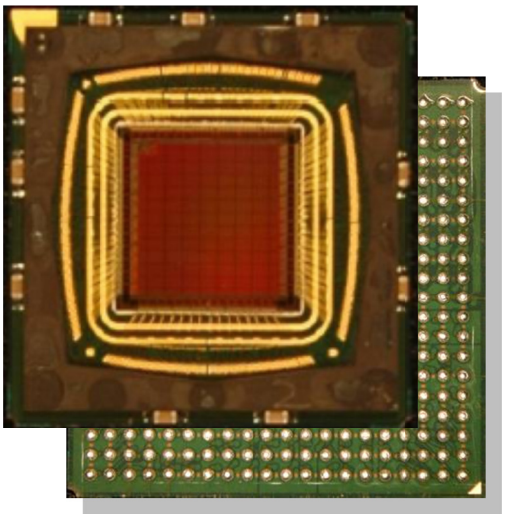
Sandia National Laboratories' structured Application Specific Integrated Circuit (ASIC) provides a radiation-hardened, via-configurable implementation platform with ASIC-like performance. Structured ASICs enable rapid turn-around, lower Non-Recurring Engineering (NRE) and development costs. Pre-qualified base arrays reduce development risk, while open architecture minimizes Diminishing Manufacturing Sources (DMS) issues. Enables safe, secure, user-defined trusted hardware, and the regular, fabric-like structure enhances verifiability of trusted parts.

Special Features

- Metal-via configurable, fabric-like structure using ViASIC™ ViaMask Technology.
- Four Power-Quadrants with specialized interface circuits that allow up to four independent power supplies for power sequencing and redundancy operations.
- Unused transistors and circuits are isolated from power and ground to minimize power consumption, static current and photocurrent.
- On-package decoupling capacitors.

Applications include:

- Command & Control
- Instrumentation
- Sensor Monitoring
- Obsolescent Parts & FPGA Emulation
- Rad-hard environment operations
- High-Reliability Systems

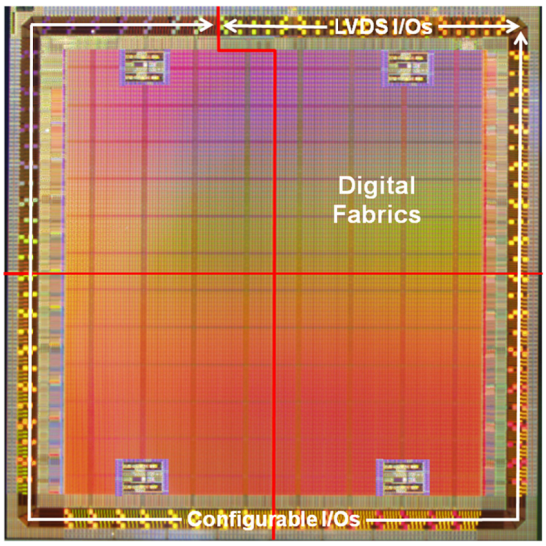


Sandia National Laboratories has historically focused on high-reliability custom solutions for high-consequence applications. Today Sandia is a DoD Category 1A Accredited Supplier of both "trusted design and foundry services" with an efficient and disciplined ISO 9001 certified process optimized for high-mix low-volume custom radiation-hardened, digital, analog and mixed-signal ASICs. With in-house capabilities in packaging, test, failure analysis and reliability, Sandia offers a total supply-chain solution for high-reliability custom microelectronics for expanding national security applications.

MICROSYSTEMS SCIENCE, TECHNOLOGY & COMPONENTS

ViArray Standard Platforms

Eiger
Digital Rad-Hard ViArray

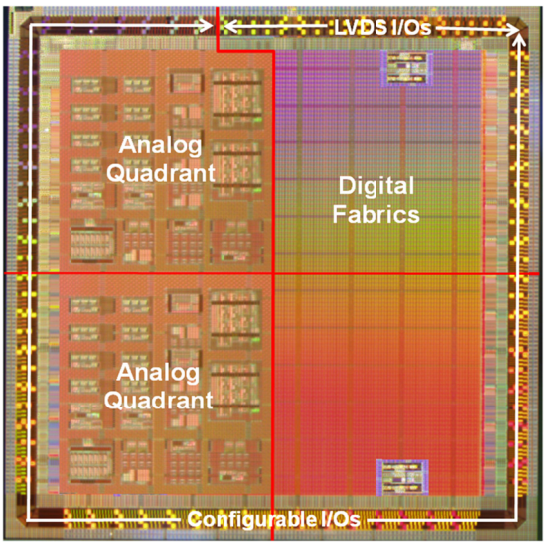


Die Size 12 mm X 12mm

Digital Functions

- 276K Gates
- 368Kb Dual-Port SRAM
- 384Kb Configurable ROM
- 4 Oscillators
- 4 Phase Lock Loops
- 4 Power Supply Monitors
- 4 Power Partitions
- Isolated Unused Circuits
- 239 Configurable I/Os (PCI compatible)
- 8 Pairs LVDS I/Os

Whistler
Mixed-Signal Rad-Hard ViArray



Die Size 12 mm X 12mm

Analog Functions

- 2 Oscillators
- 2 Phase Locked Loops
- 4 Power Supply Monitors
- 4 Bandgap References
- 2 Chopper Bandgap/Bias
- 5 High Side Current Monitors
- 4 Low-Speed A-D Converters
- 4 Pipeline A-D Converters
- 8 D-A Converters, 8-bit
- 8 Multiplexers, 32:1
- 2 Temperature Sensors
- 64 Comparators
- 48 Amplifiers
- 128 Analog Switches
- 1 Analog Transient Recorder

Digital Functions

- 138K Gates
- 184Kb Dual-Port SRAM
- 192Kb Configurable ROM
- 4 Power Partitions
- Isolated Unused Circuits
- 239 Configurable I/Os (PCI compatible)
  - 4 with High/Low Voltage Analog Inputs
- 8 Pairs LVDS I/Os

Technology:

- 3.3 v
- 0.35 µm
- SOI CMOS

Package options:

- 400 pin plastic BGA 27x27 mm
- Other package options in development

For more information email snlasic@sandia.gov

U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration

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