Flexible Hybrid System
“Combination of flexible printed materials and flexible silicon-based ICs to create a new class of flexible electronics.”

Printed Electronics
- Sensors
- Interconnects
- Substrates
- Displays
- Low Cost, Large Format
- Roll-To-Roll, Screen, Inkjet Print,

Flexible FleX-ICs
- Sensor Signal Processing
- Data Processing
- Data Storage
- Communications
- Low Cost, High Performance
- Compatible with Printed Electronics
- Foundry CMOS + FleX Processing
Flexible ICs required to achieve a fully flexible system

- Traditional packaged parts and bare die can be surface mounted to flexible substrates
  - Create rigid “islands” in flex substrates and/or
  - Rigid parts delaminate with even gentle curvature

Test Setup:
- \( V_{dd} = 2.5V \)
- \( V_{ss} = 0V \)
- \( I_{bias} = 10\mu A \)
- \( I_{in-pos} \) = 1kHz square wave (YELLOW trace on oscilloscope)
- \( I_{in-neg} \) = connected to \( Out \), voltage follower configuration (BLUE trace on scope)
- \( Out \) = connected to \( I_{in-neg} \), voltage follower configuration (BLUE trace on scope)

Flex Op-Amp functions at 5mm radius of curvature!
Our patented Semiconductor-on-Polymer process converts conventional semiconductor wafers into ultra-thin ICs that can bend like paper while still providing the high performance logic and high density memories necessary for flexible hybrid electronics systems.

We have developed industry-leading capability for die attach and electrical interconnects to integrate FleX-ICs with printed electronics to create Flexible Hybrid Electronics.
New Boise, Idaho Facility – Headquarters and Manufacturing

- Small Business
- Privately Held
- Founded Nov. 2001

Member:

Flexible Hybrid Lab

Class 100 Cleanroom

9,000 s.f. FHE Manufacturing Facility

- Flexible Hybrid Assembly
- IC Design
- Antenna Design
- FleX-ICs

- Thin Wafer Processing
- FHE System Integration
- Failure Analysis
- FleXform™ Dev Kits
Boise Facility Production / R&D
FHEMII
Flexible Hybrid Initiative

Technology-Focused Nodes
- Groups of organizations focused on complimentary technologies
- Able to assist with tech-specific roadmaps
- Assist with tech-specific Workforce Development
- Build strong proposal teams

Regionally-Focused Nodes
- Represent FHE MII interests regionally
- Assist with regional Workforce Development initiatives
- Build strong proposal teams
- Utilize State cost share
Thank You
Products are starting to emerge

- Asset Monitoring Systems for structural, quality, and performance
  
- Wearable monitoring for Medical and Performance
  
- Consumer product safety, new features.
FleXform-ADC™ Development Kit

FleXform-ADC Kits provide:

• SOTA FHE System
• Supports printed sensor development
• User printable FHE with on-board FleX-ADC™
• Integration Board and Software
• Enables printed device demonstrations
• Fully supported by ASI flexible technology integration team for design and manufacturing

FleXform-ADC Kit contents:

• Quick Start Guide
• FleXform-ADC printed circuit board (PCB)
• Two button cell batteries
• One 8.5” X 5.5” flexible circuit board sheet with two instances of the FleXform-ADC flexible circuit board (FCB)
• Additional documentation, videos and software development tools are available for download

This work sponsored in part by Air Force Research Laboratory