Revolutionizing RISC-V based application design possibilities with GLOBALFOUNDRIES

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RISC-V: Driving New Architectures and Multi-core Systems

GF Enabling various End-markets with RISC-V Processor applications

AI –DNN Accelerator/Engine

Automotive/Embedded SoC

Cluster Computing

Edge & IoT
AI- Deep Learning
Wireless Cameras
Surveillance
Embedded
Drones
Automotive

Source: RISC-V Consortia, GLOBALFOUNDRIES assessment

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Leadership FDX™ Roadmap 22FDX® and 12FDX™
GF Optimized process technology for RISC-V based SoCs

Architected for:
- Emerging products in IoT, Mobile, Auto, AI, and RF

Enables differentiated customer solutions:
- FinFET-like performance at 28nm cost
- Energy efficiency
  - Ultra-low voltage (0.4V)
  - Ultra-low leakage (1pA/μm)
- Design flexibility and integration
  - Software-controlled body-bias
  - RF integration

FDX Delivers
- Near FinFET performance
- Lower power
- Smaller die
- Fewer masks
- Lower die cost
22FDX® Markets: Targeted To Serve Key Segments

**Mobility**
AP/MPU/AI
- Body-bias equivalent to +1 node
  - Roadmap to 7nm perf. w/ 12FDX™
  - Complete processing solutions

**IoT**
BLE / NB-IoT / GPS / NFC
- Natural migration from 55/40nm
  - Lower active (~80%) and standby (1pA/cell) power than 40nm
  - PA, Switch, PMIC, eMRAM
  - As low as 36 masks

**RF & mmWave**
5G / LTE / WiFi
- Enables new RF architectures
  - Highest ft/fmax
  - Up to 30-50% area savings vs. 28nm
  - mmWave PA via SOI-stacking

**Automotive**
MCU/Radar/ADAS/IVI
- Integration for car of tomorrow
  - MCU w/ integrated eMRAM
  - mmWave for long-range radar
  - Low power ADAS

Value Extends Across Multiple Product Lines
22 FD-SOI Enabling RISC-V Processor Solutions

GF is the only foundry member of RISC-V Foundation

- Processor power optimization: 22FDX®
  - Voltage: 0.4V to 0.8V
  - Leveraging forward biasing techniques
  - Variable operating range <1W total power @ 1GHz

- FDXcelerator™ enabling partners and customers
  - Multiple RISC-V cores in design and tapeout
  - IP available: LPDDR4, MIPI, USB, PCIe, GPIO

- Offering flexible business models
  - RISC-V Soft IP and Hard IP offering for GF nodes
  - RISC-V design services for OEMs

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Accelerating RISC-V Developers and Ecosystem Partners

Reduce time to market and facilitate FDX™ SoC product design

- SiFive Core IP targeting Data Center, ML, Automotive and Embedded applications
  - E31, E51 Configurable RISC-V Cores

- Reduced Energy Microsystems - Drones, Robotics, Camera Applications
  - RISC-V IP hardware validated on 22FDX platforms
  - 32bit, 64bit Cores with Neural network IP solutions

- ANDES Cores for IoT, RF Connectivity applications
  - 32bit IP cores for 22FDX platform
  - Power efficient, smaller foot print designs

- Enabling Universities driving RISC-V innovations
  - ETH-Zurich / University of Bologna – PULP Architecture
  - Berkeley Labs, IIT Chennai
SiFive Shortening Design Cycle by Partnering with GF
Reducing significant design time and technical barriers adopting RISCV based SoC

- Making available pre-configured portfolio of RISC-V Cores
  - Targeting Data Center, ML, Automotive and embedded applications
  - E31, E51 Configurable RISC-V Cores

- 32bit, 64bit Cores pre-validated for 22FDX platform
  - No cost to customers until production starts

- Partnership enables rapid prototyping RTL to GDSII for customers
  - Lowest risk and faster time to SoC design
  - Offering lower NRE for SOC prototyping
Thank you