Advancing Physical AI with MIPS & GlobalFoundries®

Introduction & MIPS Overview

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Introduction

MIPS, a GlobalFoundries company, offers platform IP, software, tools, and silicon reference platforms for advancing the next generation of physical AI.

The adoption of AI in autonomous platforms in automotive and industrial platforms brings the world better manufacturing, vehicles, and many more applications.

The MIPS Atlas portfolio is the essential technology stack for Physical AI. MIPS delivers innovative solutions to the problems of low-latency real-time processing in platforms that require safety, efficiency, security, and quality.

We call this:

Driving Intelligence

Into Action

The acquisition expands GF’s portfolio with advanced RISC-V processor IP and software tools, enhancing its offerings for real-time computing in sectors like autonomous mobility, industrial automation, datacenters, and the intelligent edge.

MIPS brings a 40-year legacy of RISC-based innovation, now centered on the open RISC-V instruction set architecture, with a focus on scalable, efficient compute IP.

MIPS recently launched the Atlas portfolio, a suite of compute cores for real-time and AI edge processing, and Atlas Explorer, a virtual platform for early-stage design optimization.

GF’s global manufacturing and differentiated process technologies will complement MIPS’ processor IP and software tools, enabling faster innovation and smarter scaling.

Entering the Age of Physical AI

Vision Perception: Convolutional Neural Networks		2012
Creation Productive: Generative Adversarial Networks		2014
Reasoning Agentic: Reflective General Pre-trained Transformers		2024
Action Physical AI: Reasoning with Real-Time Decisions & Autonomous Action		NEXT

Physical AI Empowers Robot Autonomy

Sense, Think, Act, & Communicate in Dynamic, Unpredictable Environments

Sense:
Gather Data from Environment

Think:
Process Data to make Decisions

Act:
Execute Commands via Motors/Actuators

Communicate:
Share Status & Data Internally/Externally

The Edge Applications That Advance Physical AI

Automotive:

- ADAS
- BMS
- Motor Control
- Gateway & Telematics

Industrial:

- EV Charge Infrastructure
- Energy Management
- Network & Communications
- Robotics & Automation

Aerospace & Defense:

- Onboard Computing
- Payload Controller
- Communications Management Unit
- Airframe/Cockpit Health Monitoring

Data Center Infrastructure:

- Smart NIC DPU
- Power Delivery Management
- SSD Controller

Building Physical AI Platforms for the Edge AI Era

Workload Optimized Platform		**Application Focused Silicon:** MIPS reference platforms optimized for best-in-class performance, efficiency, & low-cost enablement Semi-Custom Silicon with SW/HW co-development for customer needs, based on MIPS IP & custom SoCs
Software/Hardware Co-Design		**Advanced Optimization:** Atlas Explorer virtual platform enables pre-RTL evaluation, pre-silicon optimization, & platform digital twins Application Performance Packs accelerate safety, security, and domain-specific workload development
MIPS Processor IP		**MIPS Atlas Portfolio of Platform IP:** Multithreaded μarchitecture delivers more performance in less area for optimal silicon use Application specific compute enhancements for class-leading performance, power, & area (PPA)
Ultra Low Power CMOS		**Power-efficient, high-performance GlobalFoundries technology platforms:** Global manufacturing footprint delivers trusted and reliable source for customers around the world MIPS cost-optimized reference platforms designed for 22FDX™ & FinFET 12LP+ platforms
Commercial & Open Ecosystem		**Enabling Success in Growth Markets:** Trusted, reliable global manufacturing partners with low-power, optimized process technology Commercial and open-source ecosystem support for MIPS, RISC-V, and Physical AI adoption
Open, Modular RISC-V ISA		**Open RISC-V Instruction Set Architecture (ISA)** Easy to adopt open specification with robust ecosystem of commercial & open-source toolchains Modular for building differentiation & acceleration while ensuring compatibility & avoiding lock-ins
40-Year Heritage		**8 Product Generations:** Silicon proven in advanced process technology for safety-critical applications & data center infrastructure Supporting world-class, global enterprises & their customers in Automotive & Cloud today

MIPS Business Units

Processor IP

- Atlas Processor IP Portfolio
- Microcontrollers and Embedded Applications processors
- Best-in-class solutions built on open, RISC-V-based architectures
- Application enhanced instructions
- Functional safety certified
- Performance, Power, and Area optimized designs

Custom Silicon

- Customer Driven Application Specific SoCs
- MIPS performance-tuned cores & subsystems
- Use-case driven features
- Cost-optimized design & package
- Auto/Industrial Qualifications
- Safety-Capable Platforms
- Post-Quantum Security capabilities

Software & Tools

- Atlas Explorer
  - Virtual Platforms for MIPS IP
  - Software & Hardware Co-Design
- Application Focused Performance Packs
  - Functional Safety
  - Real-Time Control
  - & More
- Services
  - Application Customization
  - Security & Long-Term Support

MIPS Atlas Portfolio

P8700

- Scalable Applications Processor with multithreading (SMT)
- The only multi-threaded RISC-V out-of-order core with ASIL-B certification

I8500

- Scalable power-efficient Applications Processor with SMT
- The only multi-threaded RISC-V core capable of executing four threads

M8500

- High performance microcontroller for sub-10µS control loops and real-time interrupt processing
- ~33% less area than dual-IP solutions

Atlas Software

- Atlas Explorer
  - Virtual Platform for IP evaluation
- MIPS 8th gen. processors are RISC-V ISA compliant
  - Easy adoption of MIPS defined instructions and optimizations
- MIPS Software Packs
  - Safety SDKs (ISO 26262, IEC 61508, EN 50128/50657 & more)
  - Per Platform SDKs
  - Workload Specific Optimization Libraries
- Open-Source Contributions
  - Linux Kernel for MIPS compute enhancements, devices, and RISC-V optimizations
- Commercial Ecosystem Enablement
  - EDA, OS Partners
  - Safety Partners, Security Partners

MIPS & GlobalFoundries: Advancing The Next Wave of Physical AI

40 Years Of History

- Founded in 1985
  - MIPS part of ‘80s RISC Revolution
  - Multithreading Innovation
  - Domain-focused Cores
    - SGI, Sony, Nintendo, NEC, Cisco & more
- MIPS 8th Generation Atlas Portfolio for real-time compute
  - Open & Modular RISC-V ISA
- GlobalFoundries Acquires MIPS in 2025 to accelerate edge AI & compute IP capabilities

Building Momentum

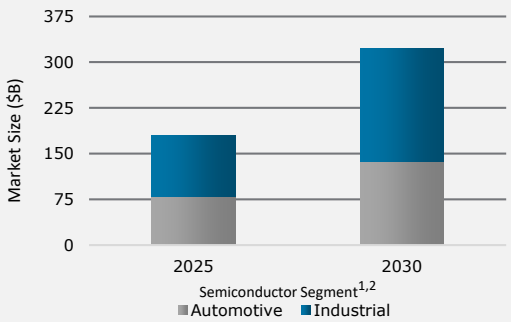
- Modern Use Cases, Supported at Scale

- 7 Generations of Mobileye EyeQ Platforms for ADAS
  - 100M units shipped
  - 40+ Auto OEMs
  - 70% of ADAS today

- 2 Generations of Smart NIC/Data Processing Unit (DPU) at Tier 1 Cloud Provider

Future Trends

- Adoption of AI
  - Real-time compute is driving growth[3]
- Physical AI Market:
  - >$1T by 2030[4]
  - $4.7T by 2050[5]
- 5-Year CAGR >10%:



1 – Automotive Semiconductor Market Size & Share Analysis - Growth Trends & Forecasts (2025 - 2030); Source: Link
2 – Global Industrial Semiconductors Market Size, Share, and Trends Analysis Report – Industry Overview and Forecast to 2032; Source: Link
3 – Forbes article ‘Real-Time Intelligence: The Essential Tech Stack For Autonomous Systems’ - Link
4 – Forbes article ‘2025: Agentic And Physical AI — A Multitrillion Dollar Economy Emerges’; Source - Link
5 – Barron’s reporting on Morgan Stanley global humanoid robotics report; Source: Link

MIPS
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Thank You

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