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AMD Élan™SC520 Microcontroller General Overview

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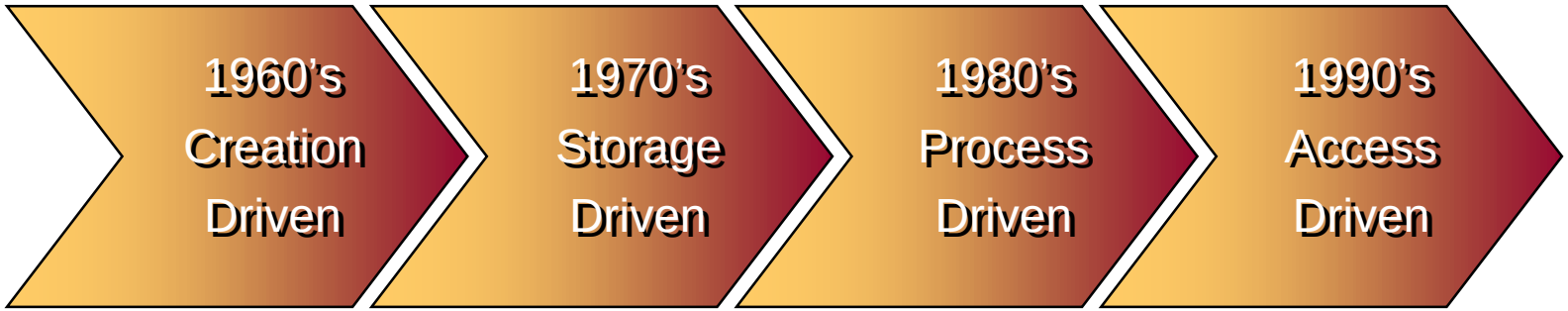
Access Driven Computing



Source: *Zona Research, 1998*

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Emerging Computing and Connection Paradigm

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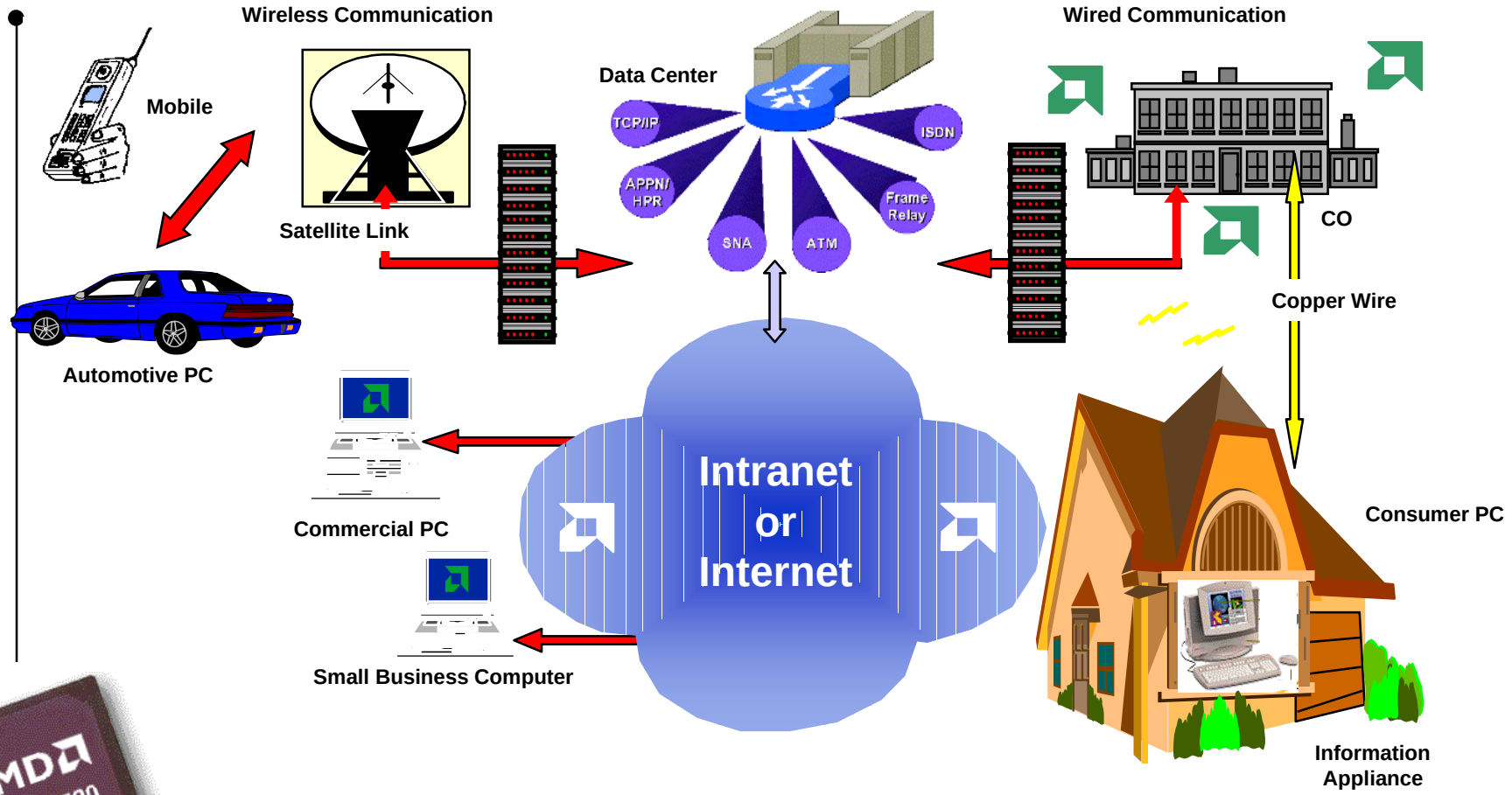

Public Network Computing

- AMD is a major IC manufacturer with a proven track record in
  - Networking
  - Telecom
  - PC's
- Corporate goal:
  - Computation and Communication

E86™ Family of Microprocessors and Microcontrollers

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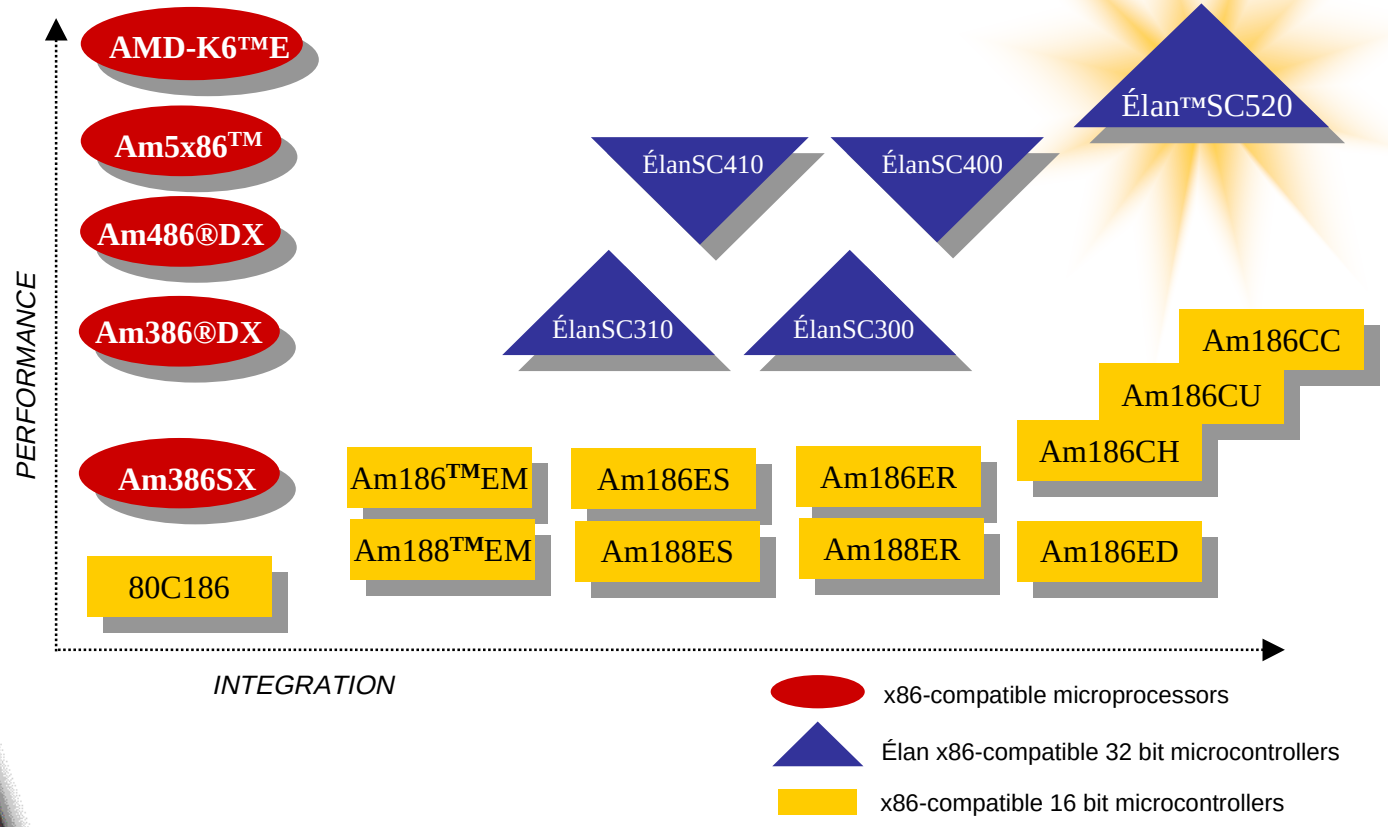

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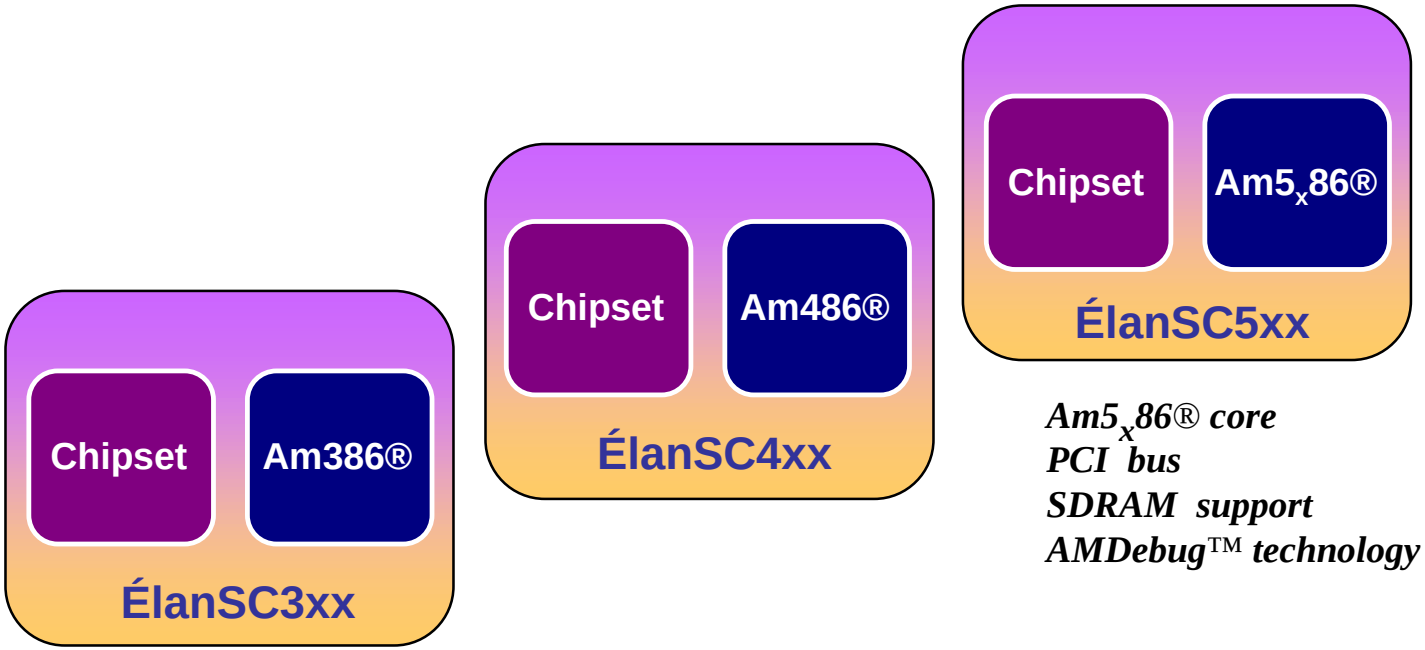
Élan™ can be Defined as "Integrated x86"



Am5x86® core
PCI bus
SDRAM support
AMDebug™ technology

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The x86 Advantage - Time-to-Market

- 91 Million units shipped in ‘97
- Multiple x86 vendors spawns competitive pricing
- Volume supports technology investment that subsidizes embedded processors
- High speed cores available
  - Frequencies now above 300 MHz
  - Performance superior to RISC
- Shrinking geometry
  - Lower and lower power
  - Packaging advances

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The x86 Advantage - Time-to-Market

- Fuels new technologies
  - PCI, USB, 1394, AGP, 3DX etc.
- Advances new memory architectures
  - RDRAM, SDRAM, EDO
  - High-speed SRAM
- Large number of HW and SW engineers familiar with the x86 architecture
  - Easier to hire, replace
- Industry's unquestioned leading tool programs
  - $2B self-sustaining annual investment
  - Unmatched quality

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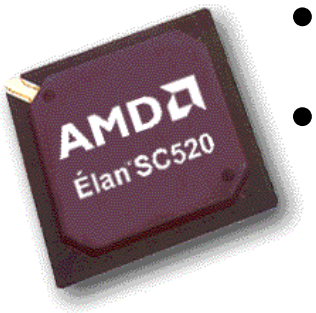
The x86 Advantage - Time-to-Market

- High code density
  - 25-40% better than RISC
    - Less RAM/ROM so lower system cost
    - Higher cache hit rate than RISC with same cache size
- 16-, 32- and 64-bit families
  - Same software base for wide range of performance
- Capitalizes on Microsoft OS dominance
- Millions of lines of code validate silicon
- Future growth path



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AMD Advantages in Embedded x86

- Embedded market focus for over 18 years
  - Strong knowledge of embedded development needs
- Continuous innovation in 16- and 32-bit families
  - Lower system cost through integration
  - Best 186 class price/performance
    - Highest performance with commodity memories
  - Best 486 price/performance
  - AMD-K6™ processor migration path and support for embedded

AMD E86™ Family Strategy for Embedded

- Embedded market focus for PC CPU core and technology investment
  - Ensure long term support and availability for CPUs
  - Leverage PC standards for embedded market
- Create 16- and 32-bit platforms using x86 cores
  - Integrate market specific peripherals
  - Use latest process and design technology
- Enable quick time-to-market
  - Tool environment, robust debugging
  - Evaluation boards, design examples

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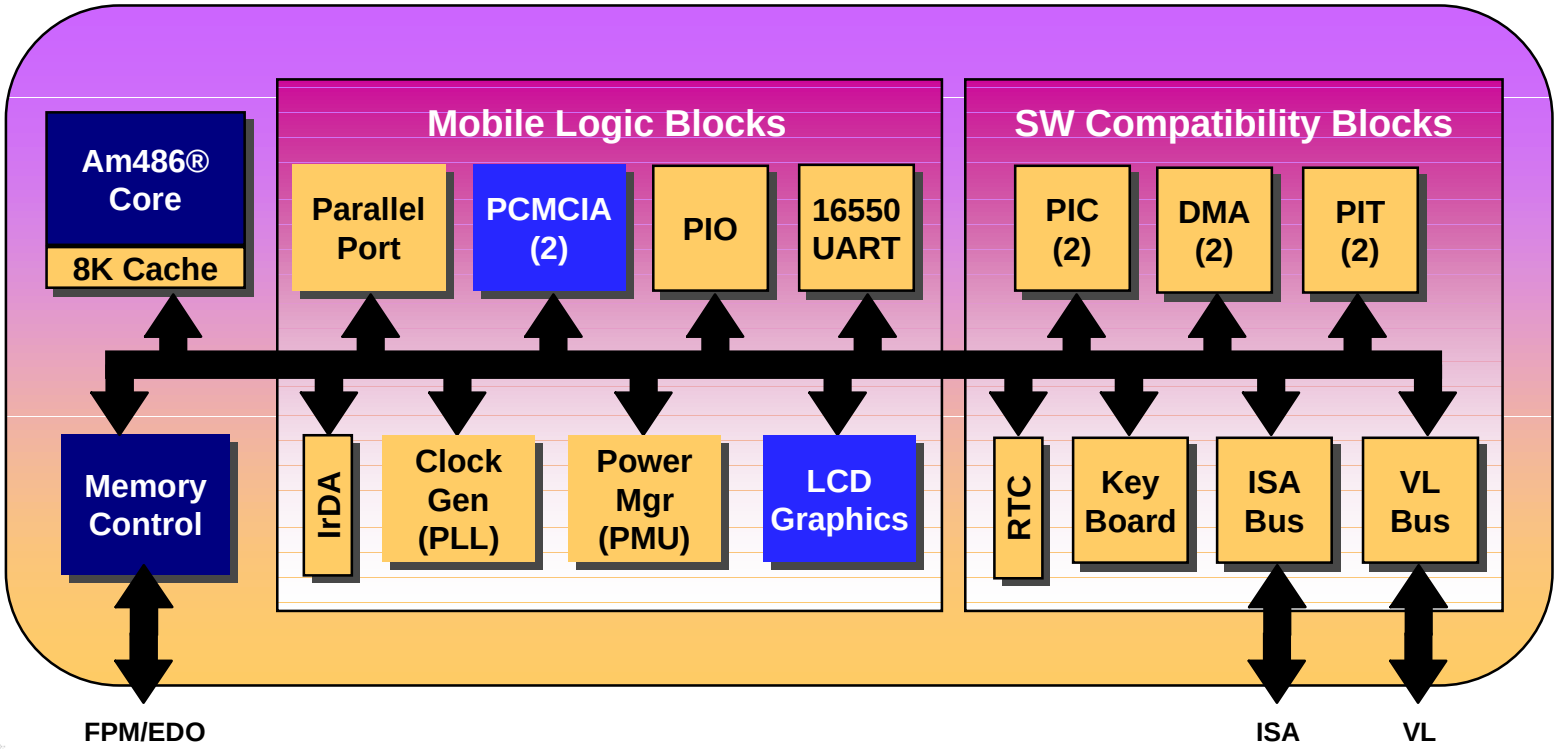
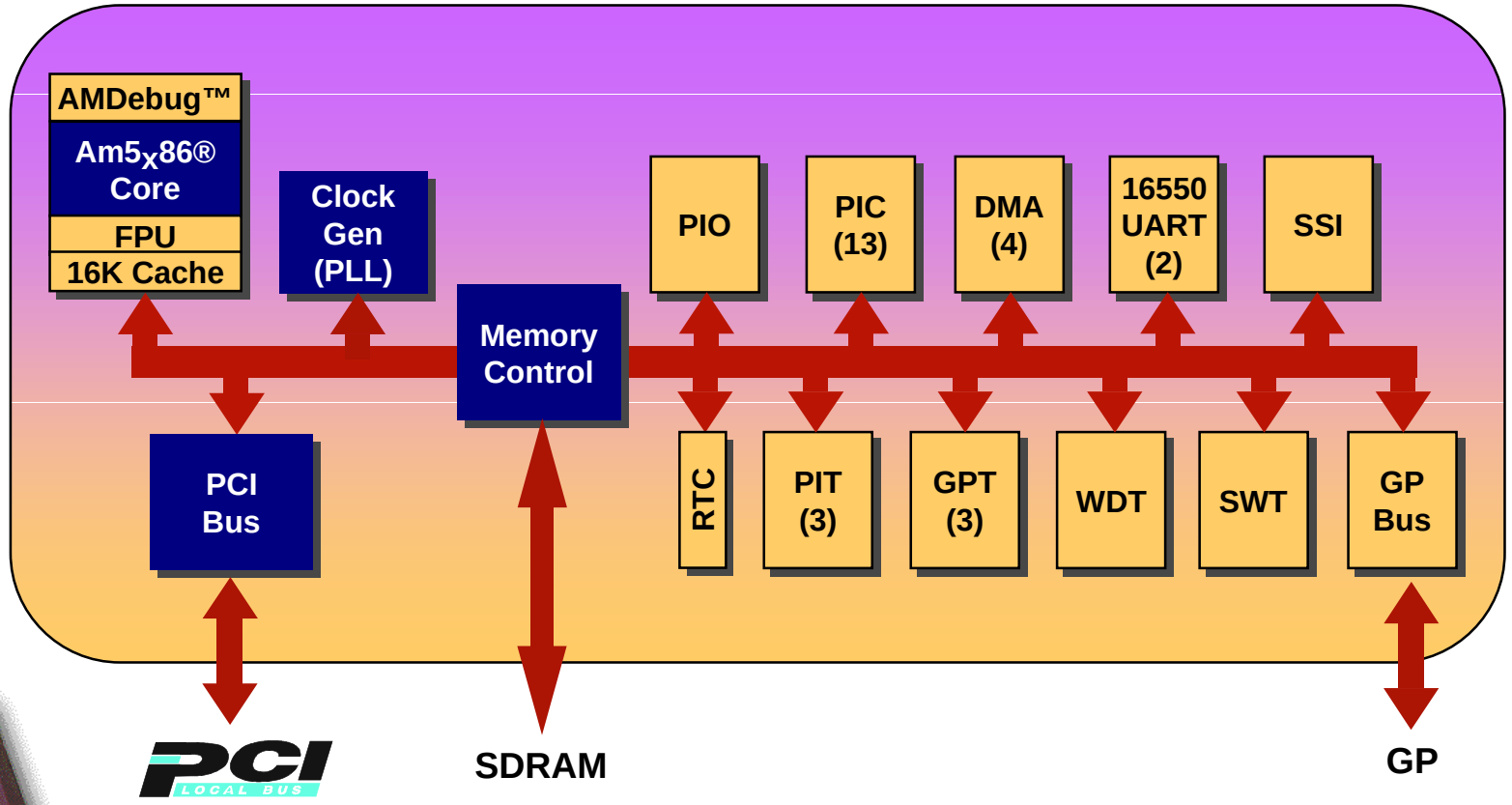
Élan™SC400/410 Block Diagram



Not featured in the ÉlanSC410

Élan™SC520 Microcontroller Block Diagram



AMD is a member of the PCI Special Interest Group (PCI SIG)

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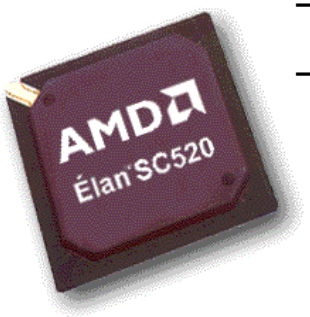
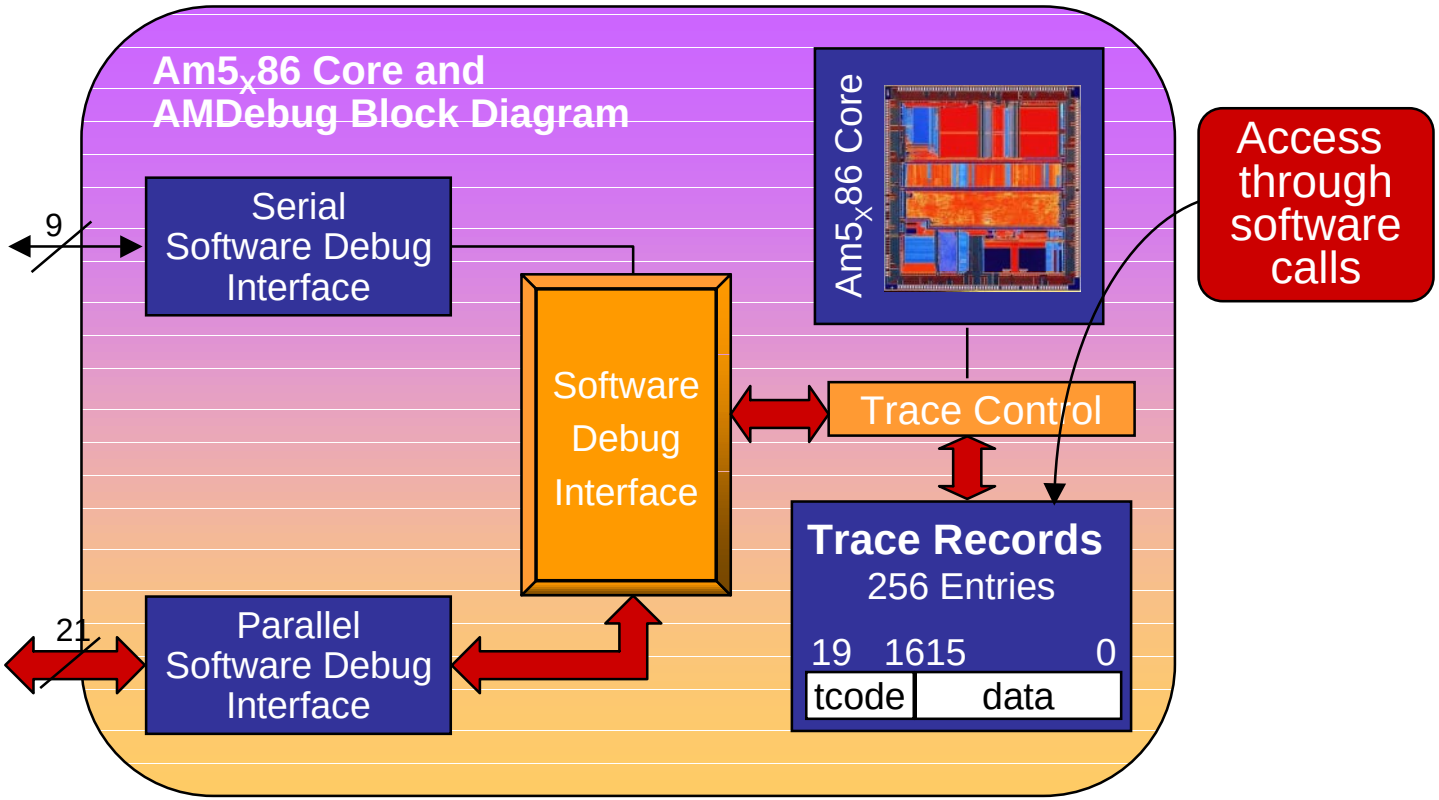
Élan™SC520 Microcontroller Features

- **Am5x86® 32-bit CPU Core**
  - 100/133 MHz target
  - 16K write-back cache
- **.25u, 4M Fabrication**
  - 2.5Vdc core operation
  - 5V-tolerant, 3.3 V I/O
  - 388 PBGA package
- **AMDebug™ Technology**
  - Affordable ICE-like features
  - Support via a serial interface
  - Debug at execution speed
- **Integrated SDRAM Controller**
  - 1-4 mixed banks of DRAM, (max 256 MB)
  - ECC memory support
  - Programmable cycle timing
  - ROM/Flash Support
- **PCI Bus 2.2 Compliant**
  - 32-bits, 33 MHz



AMDebug™ Technology in the Am5x86® CPU



Élan™SC520 Microcontroller Features

- **GP-Bus (8/16/32-bit)**
  - ROM/Flash Controller
    - For 8/16/32-bit memory
    - 8/16-bit I/O
    - Dynamic wait state
  - DMA service
  - 8 external chip selects
  - 22 interrupts
    - 15 external
    - programmable priority
- **Two 16550 UARTs**
  - DC to 1.15Mbaud
  - Two 16 byte FIFO each
  - DMA service
- **SSI**
  - Full Duplex
  - 8MHz clock
  - SPI, MICROWIRE, I^2C*, etc.

* I^2C can be implemented using the SSI with additional software support.

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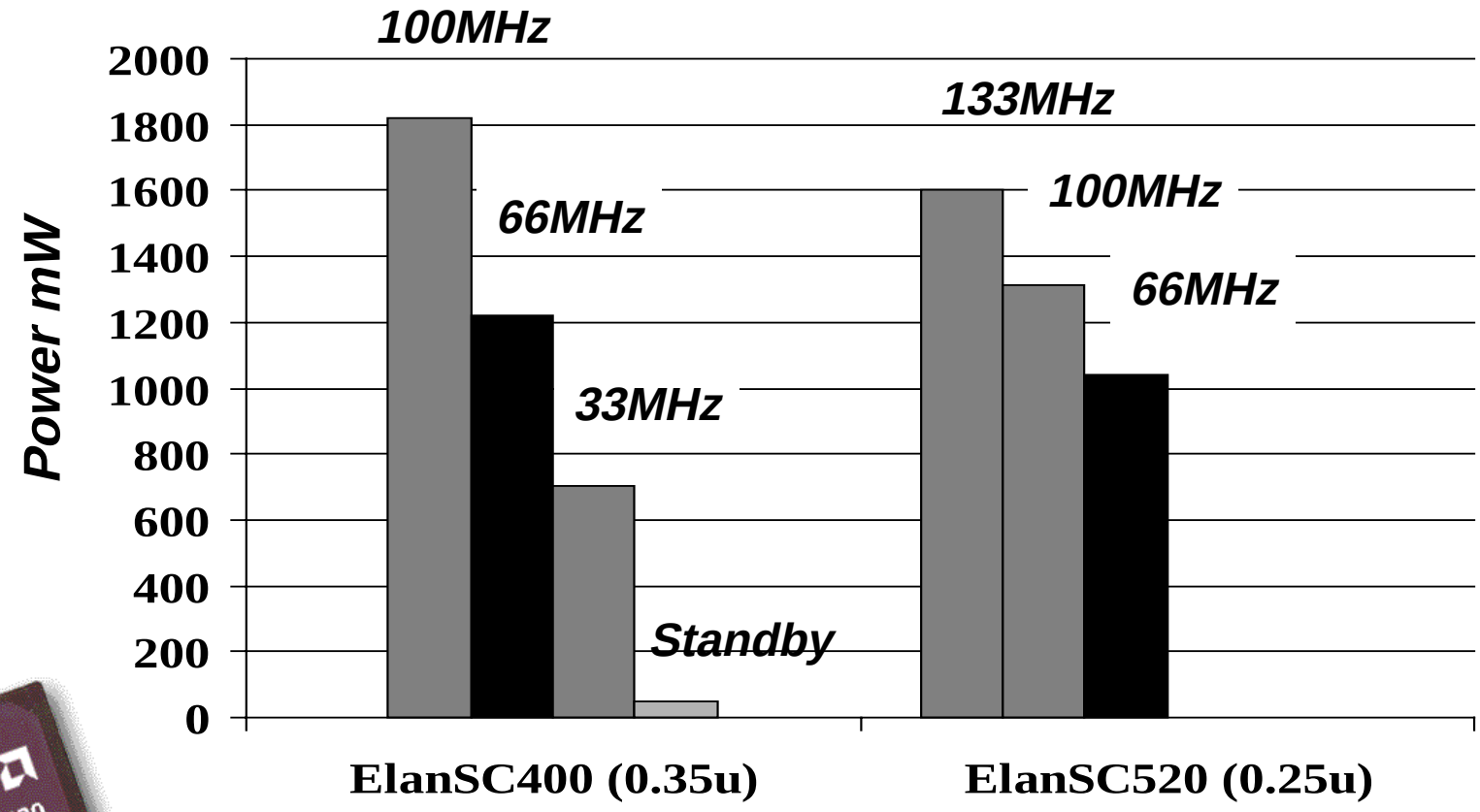
Élan™SC520 Power

Note: ÉlanSC400 does not support 133MHz



Note: ÉlanSC520 does not have PMU

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Élan™SC520 Microcontroller Target Markets

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Market		Products
• Consumer Info Appliances	⇒	Digital Set Top Box, Web Phone, Automotive PC
• Commercial Info Appliances	⇒	Thin Client, POS, Office Automation
• Public Infrastructure	⇒	Telephone Line Concentrator, C.O./PBX, cellular and broadband infrastructure
• Private Infrastructure	⇒	Smart Residential Gateway, Remote access, routers, switches, wireless access,

Digital Set-Top Box

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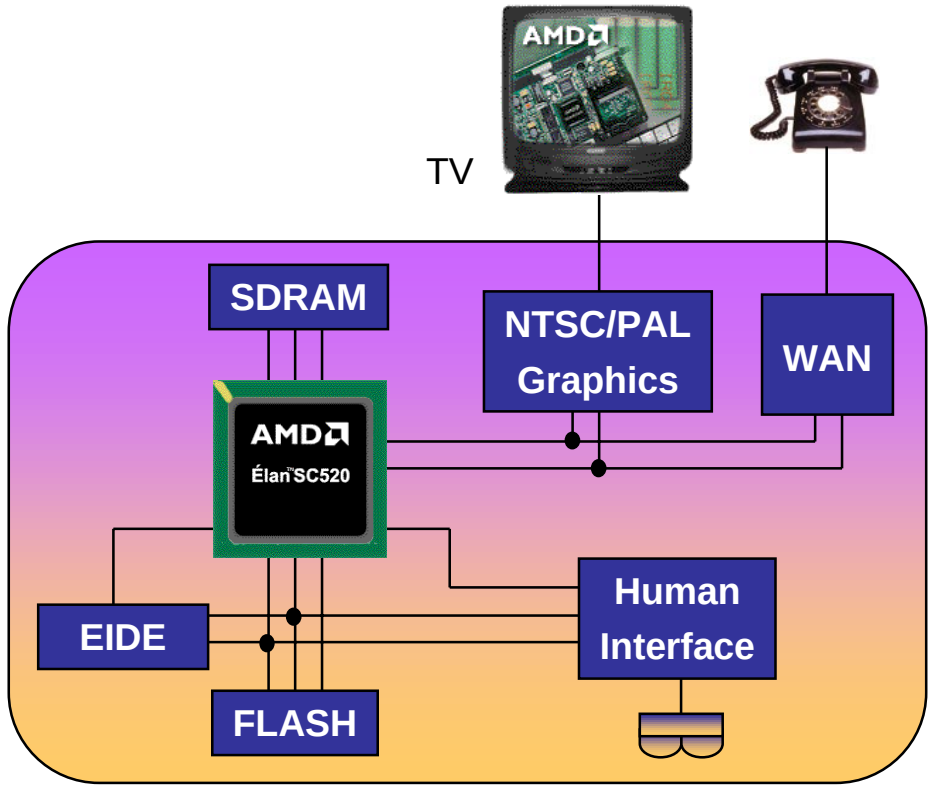
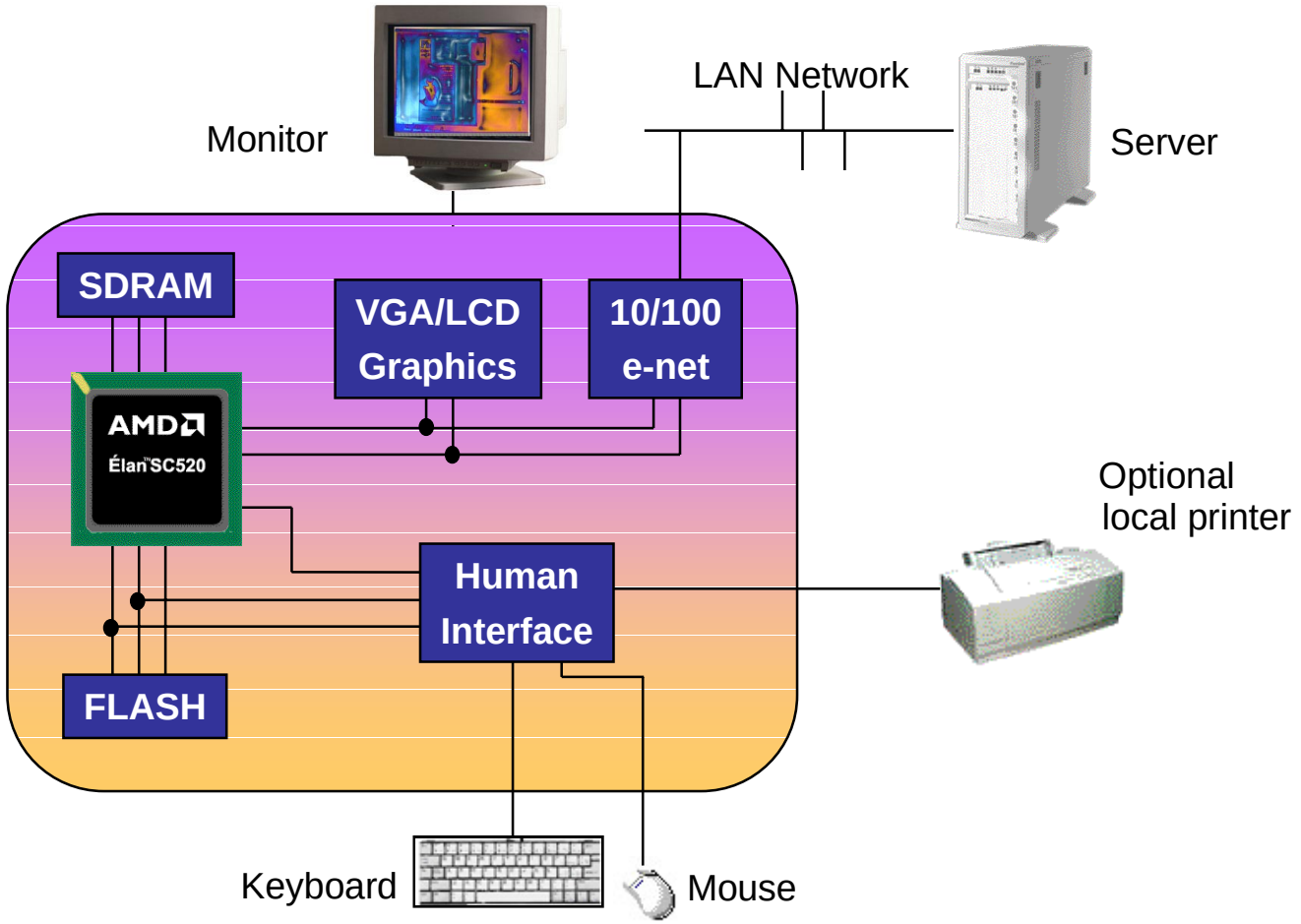


IR Keyboard/Mouse
IR Remote control

Thin Client


Monitor
LAN Network
Server
SDRAM
VGA/LCD Graphics
10/100 e-net
AMD Élan SC520
Optional local printer
Human Interface
FLASH
Keyboard
Mouse


AMD
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Telephone Line Concentrator

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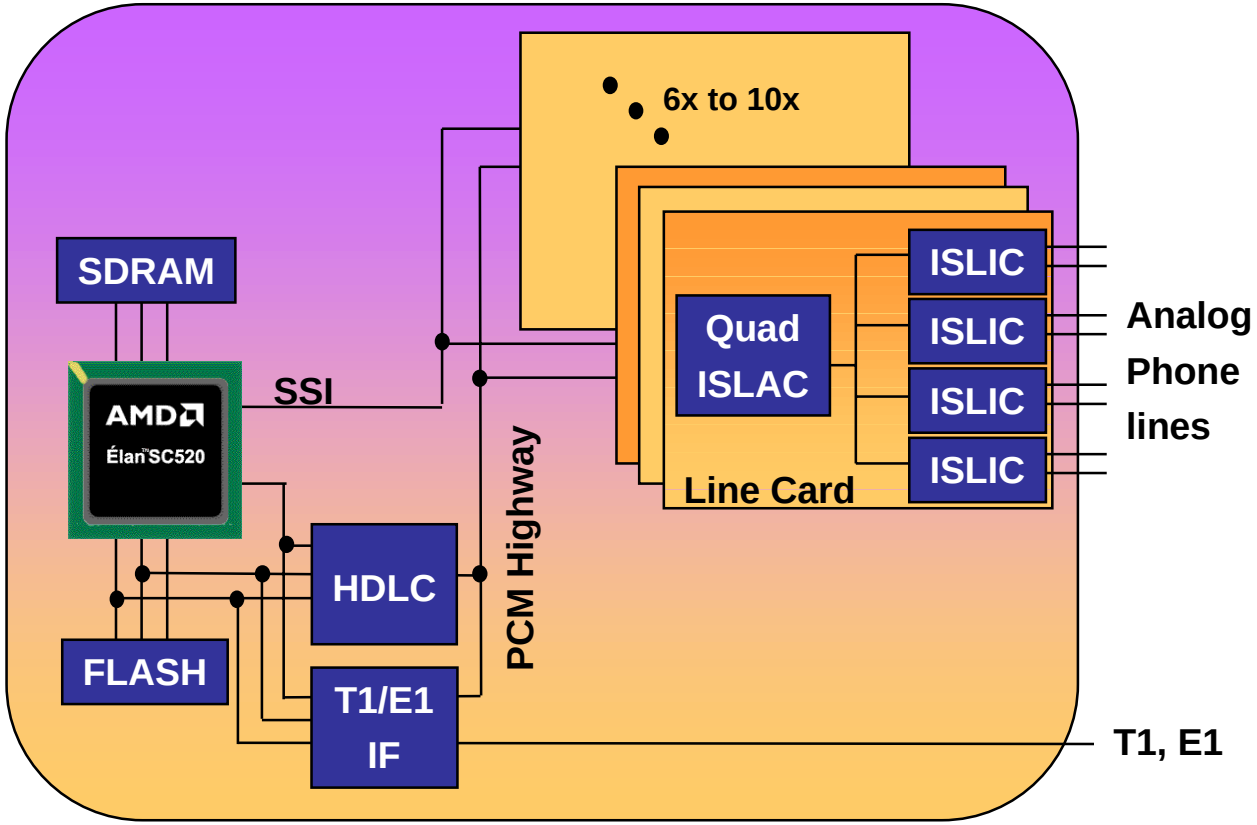

Smart Residential Gateway

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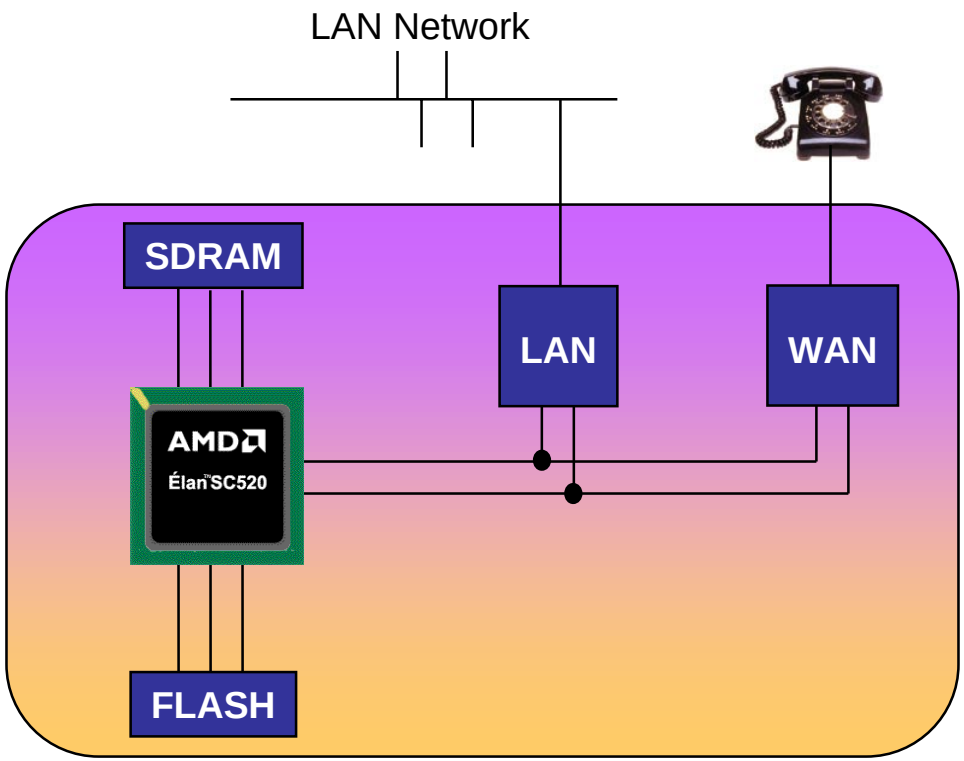

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AMD Total Solution

Improve your time to market with a
Total Solution from AMD and its partners.

- Customer Development Platforms
- Reference Designs
- CodeKit Software Packages
- Fusion Partners
- AMD Authorized Developers

Élan™SC520 Microcontroller Customer Development Platform

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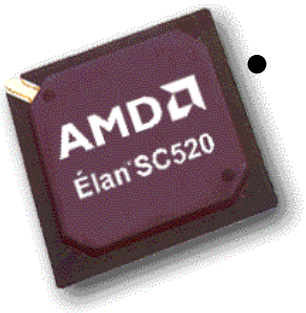
The **ÉlanSC520 Microcontroller CDP** is an excellent tool to begin hardware and software development.

- Standard PC/AT form factor
- Expansion slots, ISA and PCI
- 10/100 Ethernet
- Debug and test ports
- Large Flash memory array
- Schematics / BOM / Documentation



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Reference Designs

Reference Designs demonstrate market specific solutions with AMD silicon

- Market specific product
- Minimal feature set and board size
- Demonstration application
- Schematics / BOM
- Enclosure possible

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CodeKit™ Software Packages

CodeKit Software Packages are the standardized package that AMD uses to deliver free source code to customers.

- AMD utilities
- AMD device drivers
- Application code for reference designs

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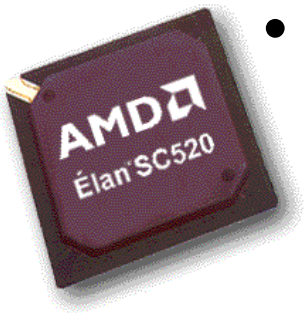
FusionE86℠ Third-Party Support Program

FusionE86 Partners are world-class suppliers of complementary technologies with proven and demonstrable examples.

- Operating systems
- Device drivers
- Development tools
- Complementary silicon
- Contract engineering



http://www.directories.mfi.com/embedded/amd-e86/

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AMD Authorized Developers

Outsourced Engineering and/or Manufacturing

- AMD µP design experience
- Advance info on AMD processors
- Special training at AMD

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Succeed with AMD!

Improve time-to-market with the x86 architecture and a total solution from AMD and its partners.

Trademark Information