The Embedded PC seminar, Paris 10/03/99

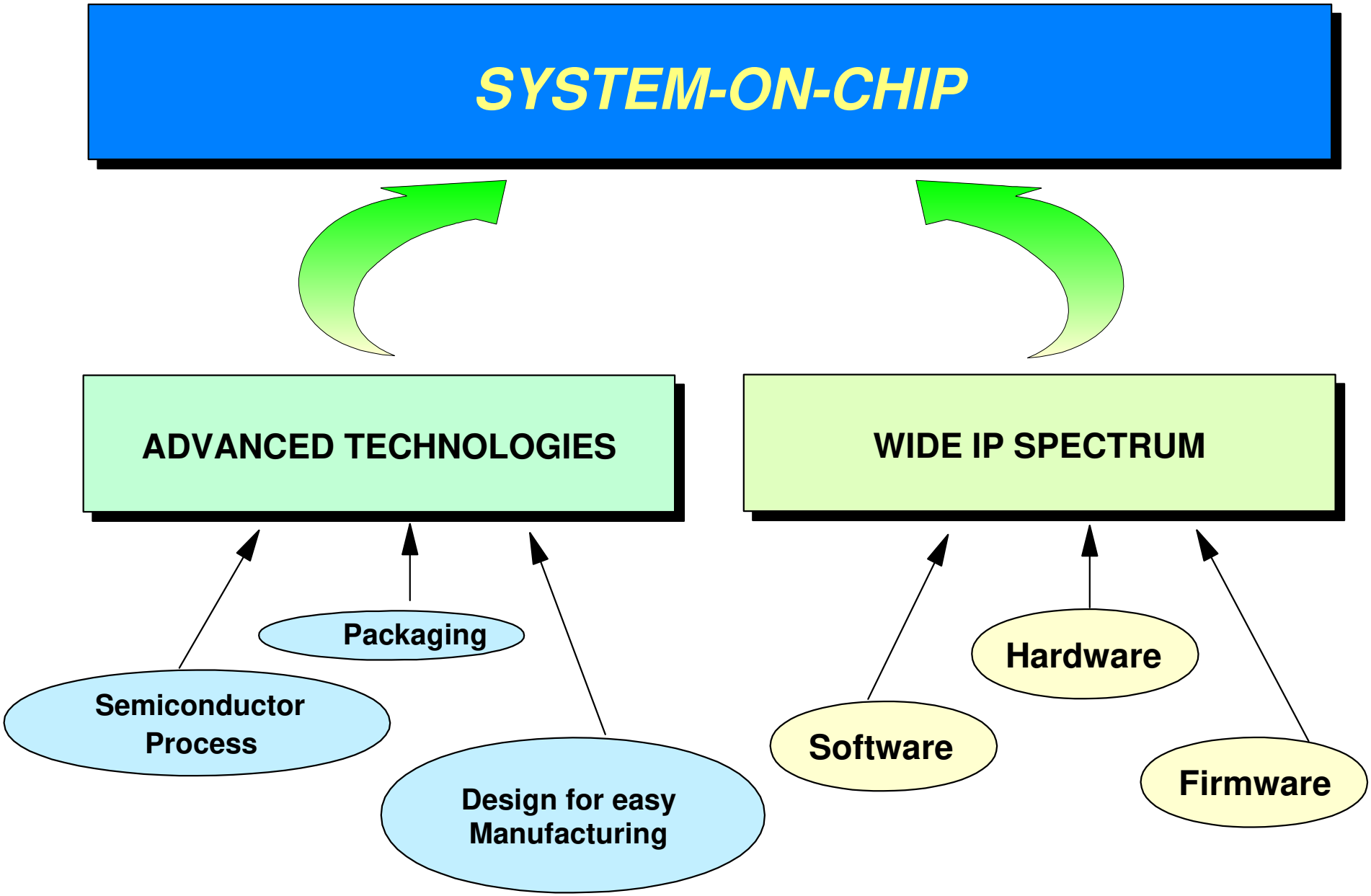
Another "System-On-Chip" from ST

AGENDA

1. *STPC* family
2. *STPC* Client/Consumer
3. *STPC* Industrial
4. *STPC* tools
5. *STPC* availability

Thierry SEIGNEURIE
Product marketing

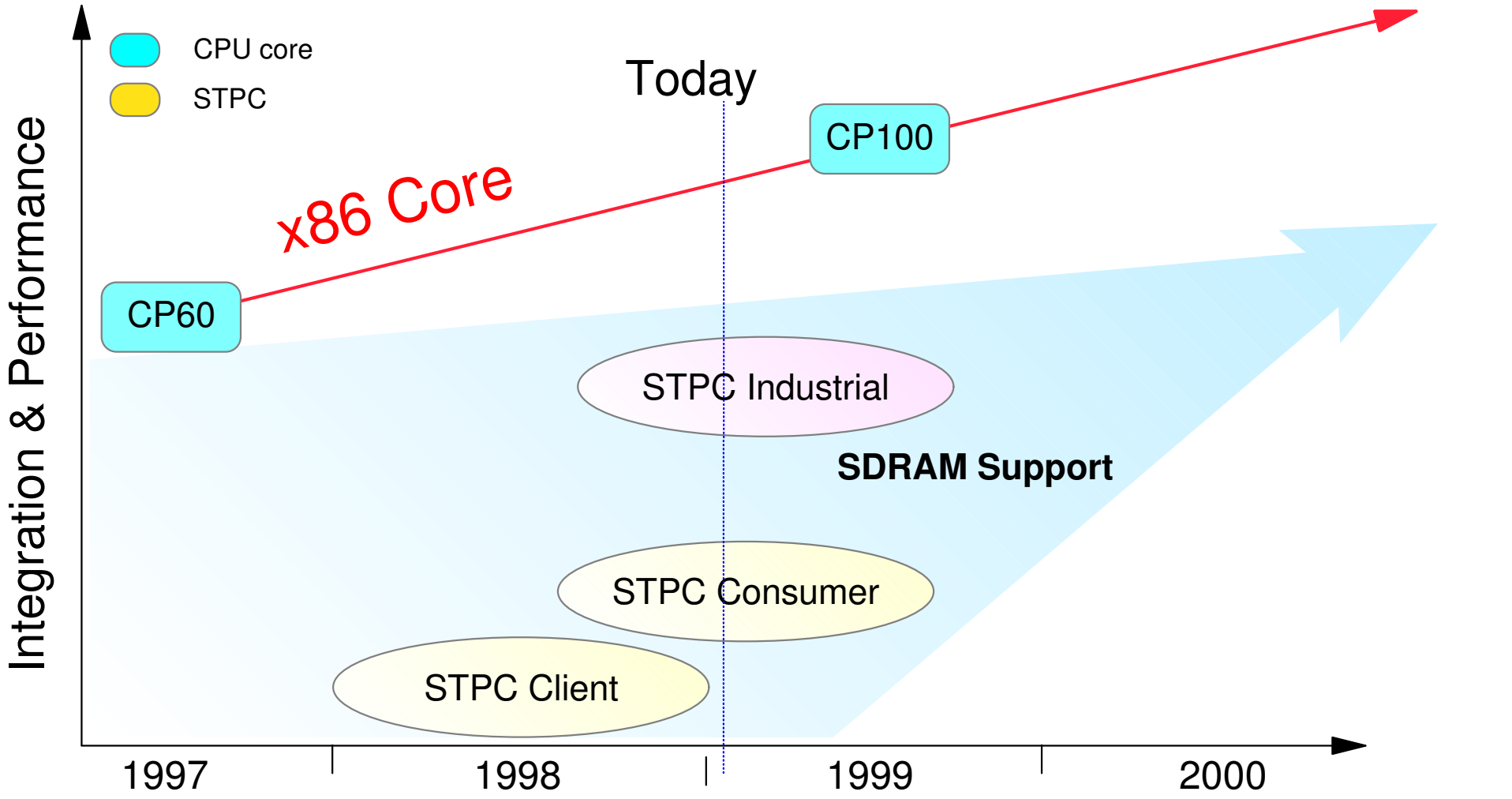
STMicroelectronics



Business Concept

- The STPC concept *does not* compete with a standard PC solution, rather *extends* the PC architecture value into new applications like:
  - Information Appliances
  - Consumer System
  - Window Based Terminal
  - Industrial System
  - Etc...
- Focusing on new low-cost information and multimedia appliances bringing the "information society" to the mass market
  - cost requirements
  - Size
  - Energy efficient (no fan required)
  - Reliability

Product Road map



IBM & ST agreement

- Standard product road map evolving from current STPC family
- Following generations to be jointly developed between ST & IBM
- IBM and ST can develop custom or derivative products separately
- IBM and ST have reciprocal second source rights on standards and custom products

STPC™ Consumer Key Features

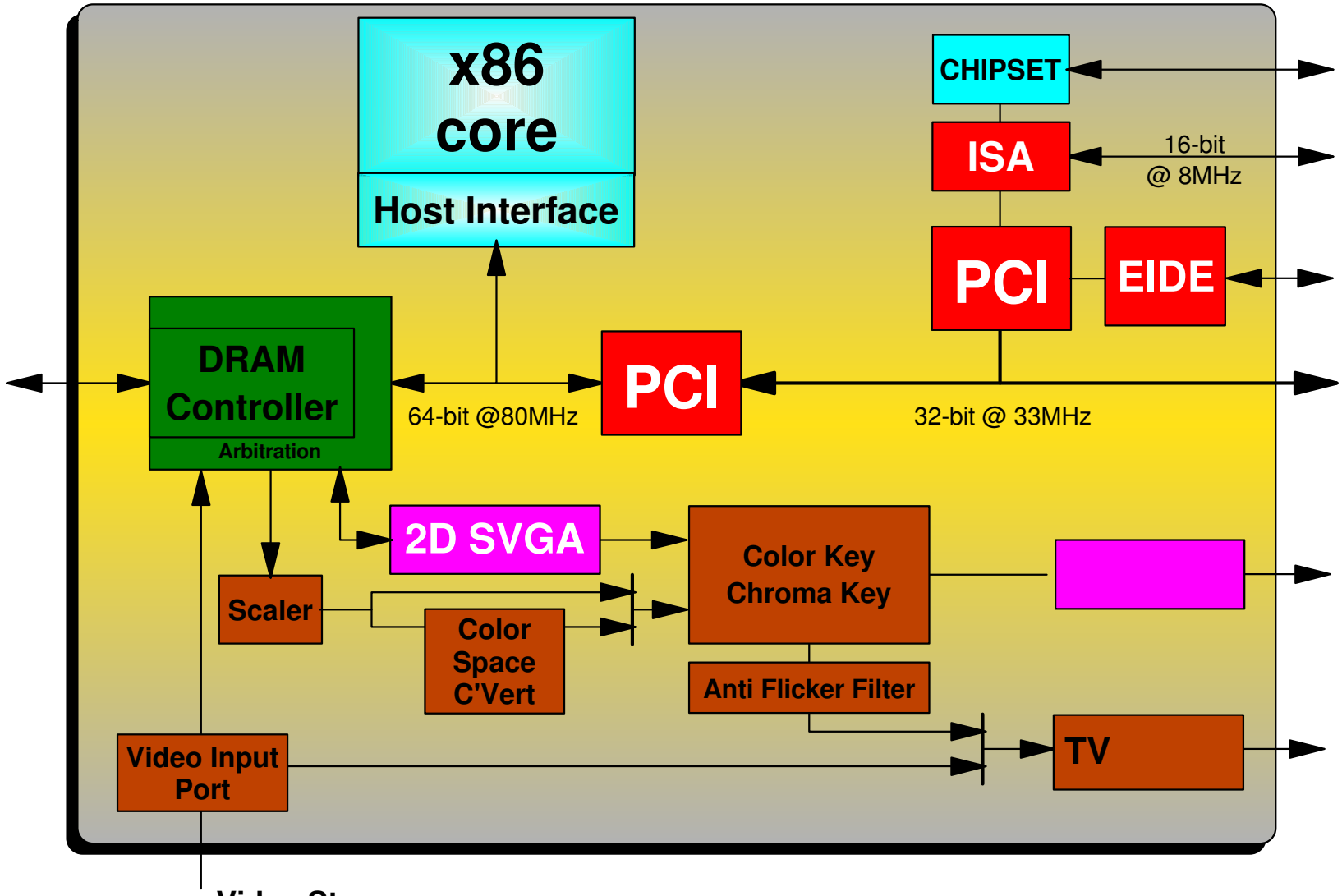
- Powerful x86 Processor Core with 64-bit interface
  - Dx 66, 75, 80 MHz,
  - Dx-2 120MHz
  - Host bus interface running at processor or half processor speed (up to 80Mhz)
  - 8Kb L1 cache - write back / through
  - Floating Point Unit (FPU) - power down for power consumption
- System memory up to 128 MB
  - Support both EDO and FPM ram
- PCI Master Controller
  - Support ISA bus
- EIDE Controller bridging off PCI bus

cont'd ...

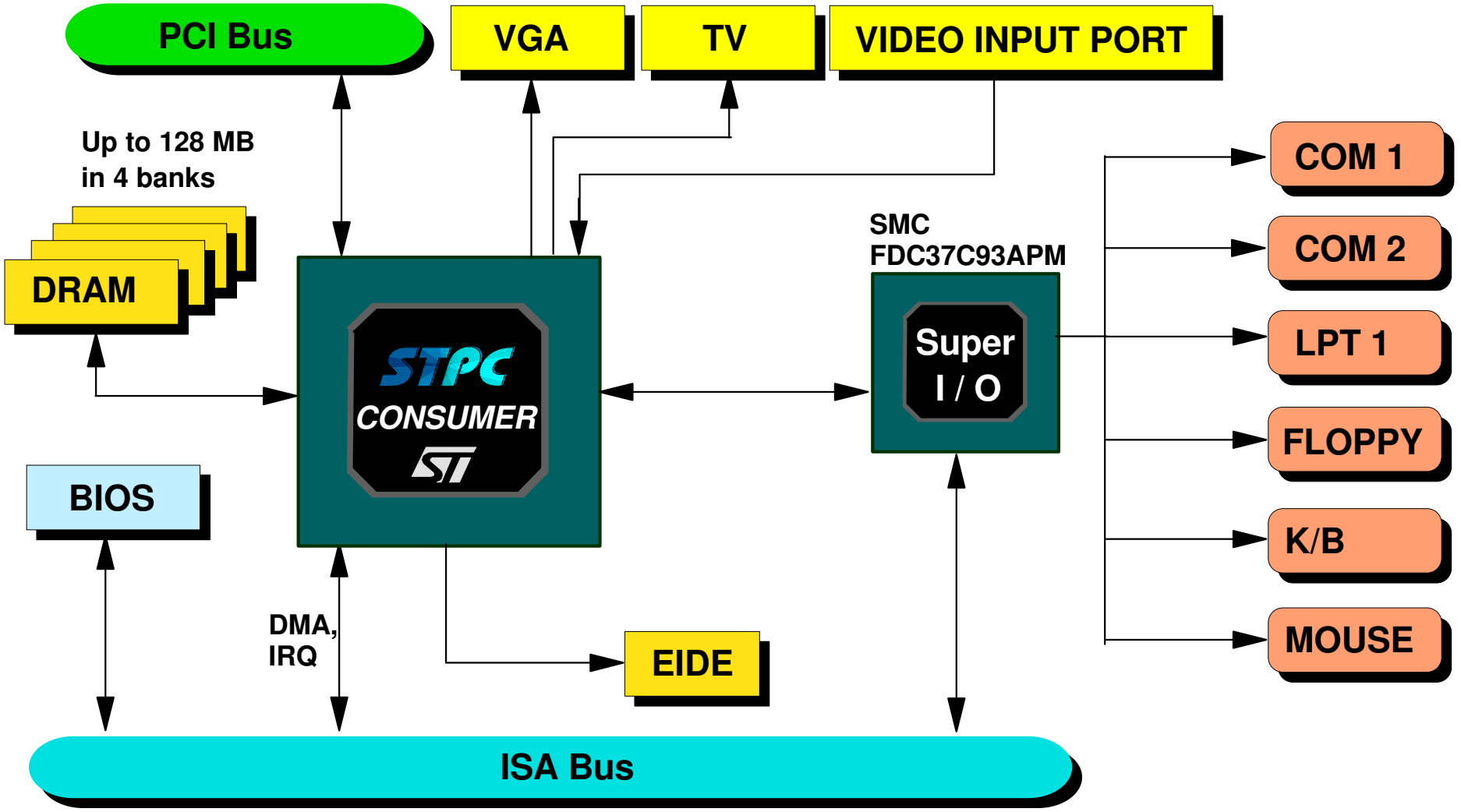
STPC™ Consumer Key Features

- 64-bits Graphics Accelerator Controller
  - Up to 4 MB long linear frame buffer
  - Complete backward compatibility to IBM VGA, SVGA standards
- CRT Controller - integrated 135 MHz RAMDAC
  - 1024 x 768 resolution, 8, 16, and 24-bit color depth
- TV Output
  - Anti-flicker filter for high quality output
  - Video Input pipeline to memory for digital and graphics mixing with hardware Color key and chroma key supported
    - ✓ Or direct bypass output to TV encoder
  - PAL or NTSC output on CVBS, S-Video, SCART supported
- Simultaneous TV and Monitor output
  - Video full screen on TV, or in a flexible window

STPC™ Consumer Architecture



STPC™ Consumer Block Diagram



STPC™ Industrial Key Features

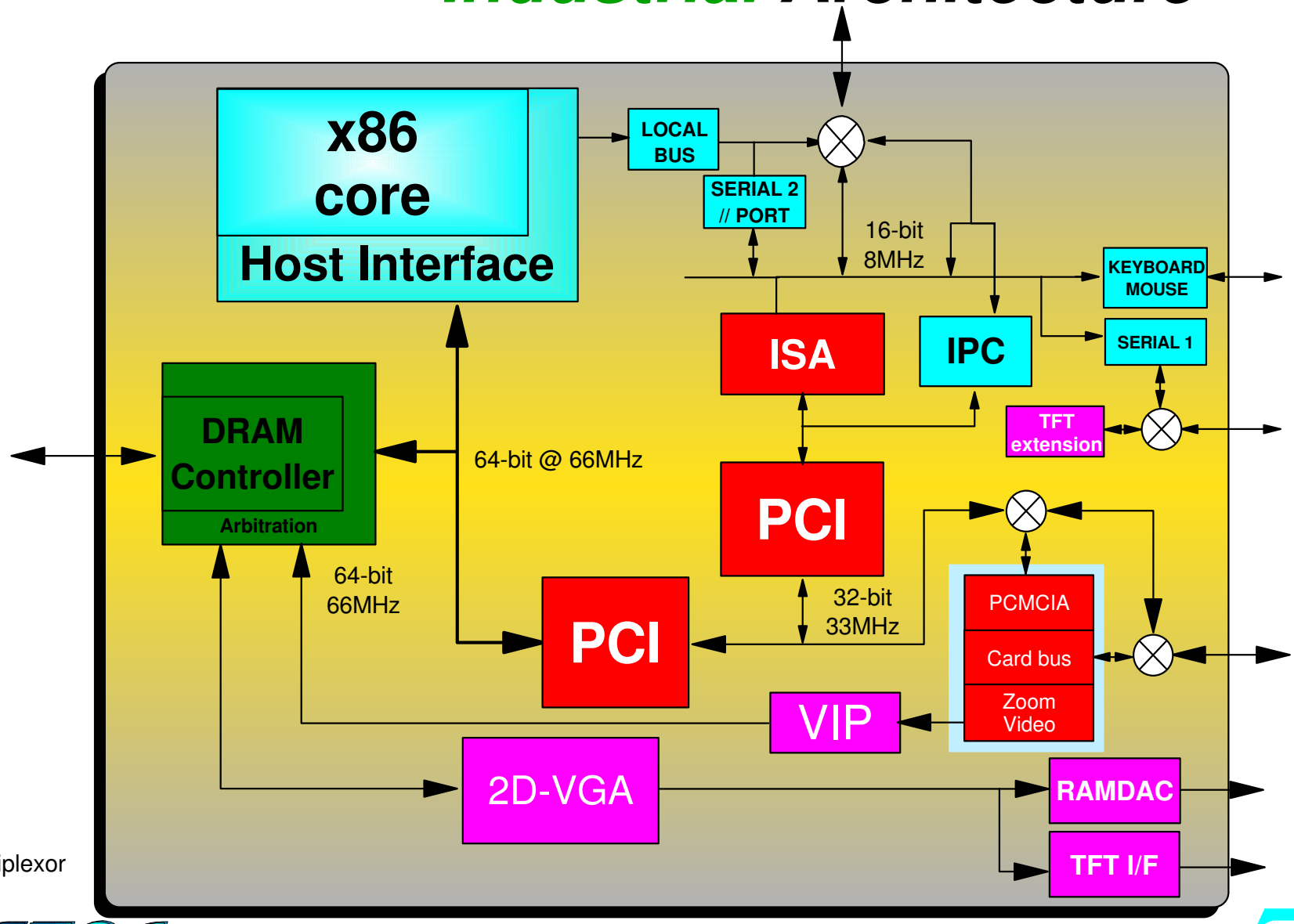
- TFT Display Controller
  - Programmable Panel size up to 1024x1024 pixels
  - 1 pixel per clock with 9, 12, 18-bit interface
  - 2 pixels per clock with 2 x 9-bit interface
  - Built-in interface to PanelLink™ devices
- PC Card / CardBus interface
  - Support one PCMCIA 2.0 / JEIDA 4.1 68-pin standard socket
  - Support video part of Zoom Video through Video Input Port
  - DMA support
  - Power management support
- Local Bus Interface
  - 66, 75, 80-MHz low latency 16-bit bus
  - Allows quick system bootup and XIP (execute-in-place) in Flash
  - Programmable Flash EPROM Chip Select

cont'd ...

STPC™ Industrial Key Features

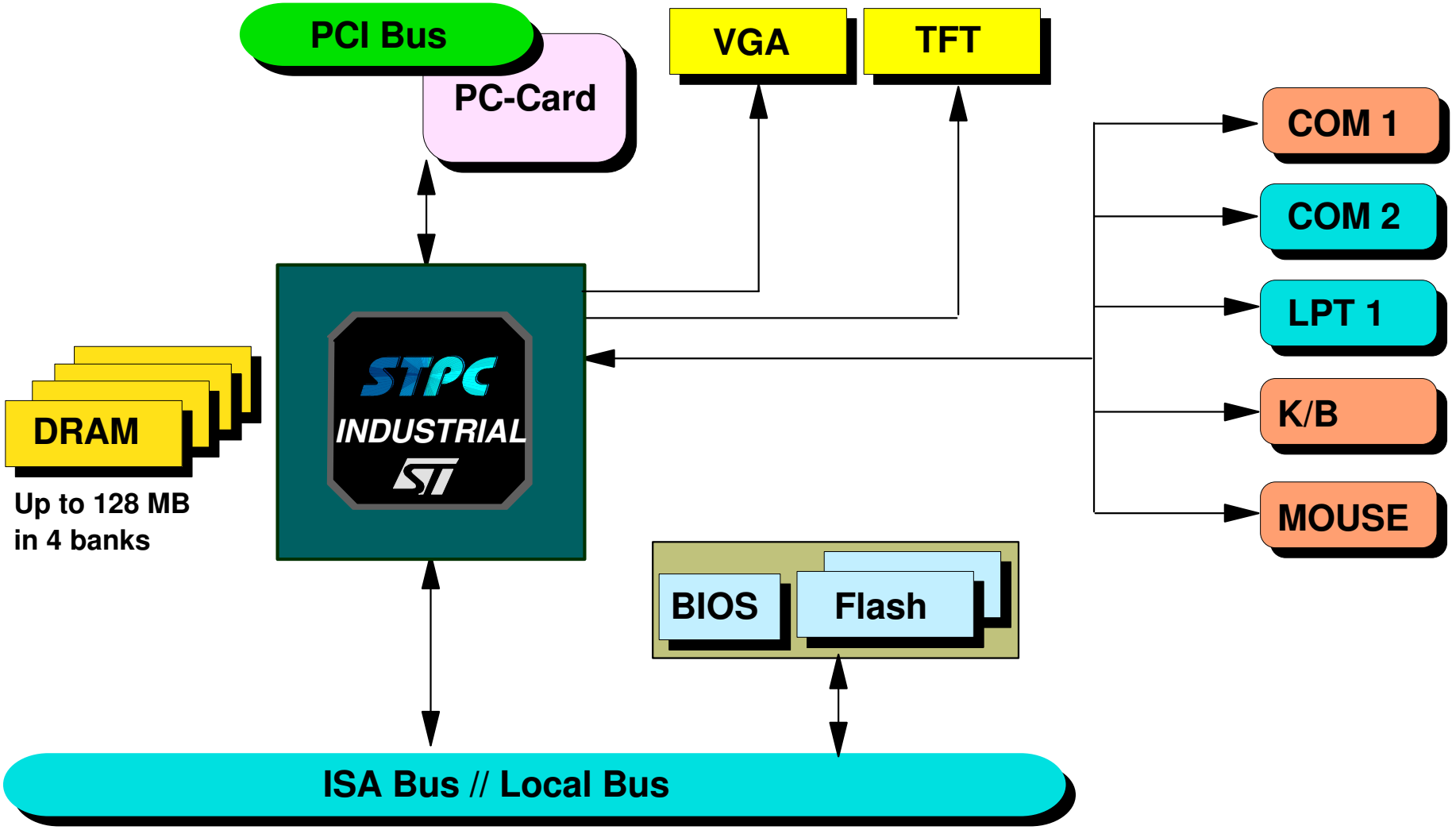
- Integrated controller Keyboard, mouse, Serial and Parallel port
- Powerful x86 Processor Core with 64-bit interface
  - Dx-1 66, 75, 80 MHz,
  - Dx-2 120MHz
  - Host bus interface running at processor or half processor speed (up to 80 Mhz)
  - 8Kb L1 cache - write back / through
  - Floating Point Unit (FPU) - power down for power consumption
- System memory up to 128 MB
  - Support both EDO and FPM ram
- PCI and ISA Bus support
- Operating temperature: -40 to + 85 °C

STPC™ Industrial Architecture



⊗ : Multiplexor

Industrial Block Diagram

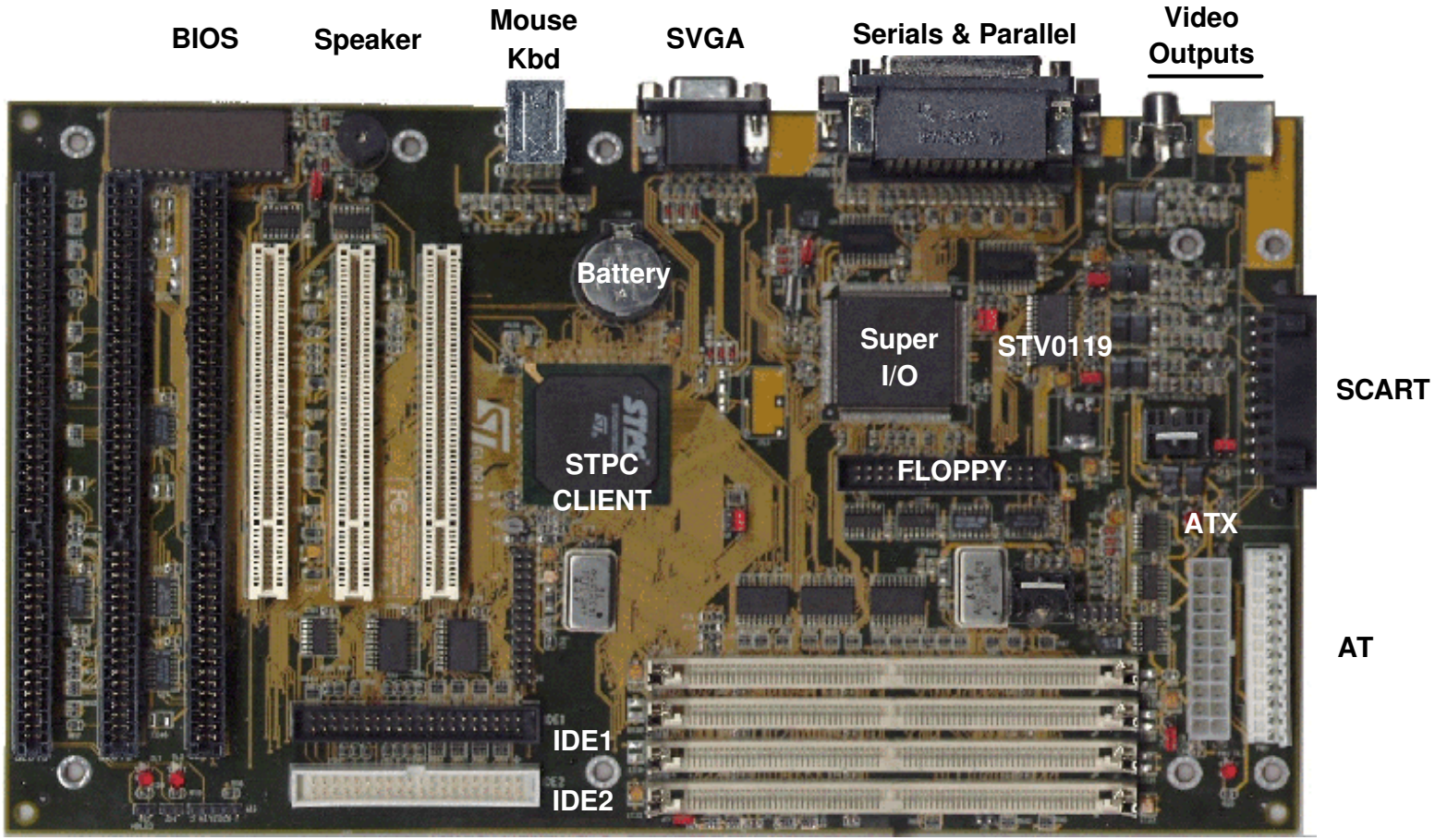


Enabling the STPC™ Solution

- Datasheets
- Evaluation boards for each reference with full functionality
- Drivers available for :
  - WinCE graphics drivers with TV output and video overlay
  - Windows 3.1 / 95 / 98
  - QNX
- Hardware Reference Design
- Databook
- Application Notes
- BIOS Writers Guide
- BIOS Supported : AMI, Phoenix, General Software
- Graphic modes Writer's Guide
- Software Writer's Guide

http://www.st.com/stpc

GLORIA Board



Software support - BIOS strategy

BIOS writers guides (system & graphic) and :

- **Licenced BIOS**
  - ✓ AMI (standard with evaluation boards)
  - ✓ Phoenix
  - ✓ General software
  - ✓ TinyBIOS (PCEngines)
  - ✓ miniBIOS (+ RomDOS DataLight)
  - ✓ Award : Planned for 1999
- **Free Graphic Bios (Binary form only)**
  - ✓ By/from ST based on Elpin sys inc.

Embedded BIOS support

- **DOS boot loaders**
  - ✓ system.initialization from DOS
  - ✓ Load and launch RTOS (Wce) from disk
- **Bios-less boot**
  - ✓ Rom based (flash /eprom) initializer
  - ✓ Does system.initialization & RTOS launch

Software support - OS strategy

- Drivers provided by ST
  - Includes all drivers, all features, free of charge
    - ✓ DOS
    - ✓ Windows 95/98
    - ✓ Windows CE
    - ✓ Windows NT Q2/99
- Drivers provided by third party
  - QnX
    - ✓ See Partner for financial details
  - And . . .
    - ✓ VxWorks/WRS Q3/99
    - ✓ Linux

STPC™ Availability

Devices	Speed (MHz)	Status	Remarks
Client	Dx 66, 75	Production	1st STPC device
Eval. board Gloria		Available now	
Consumer	Dx 66,75,80	Production	Integrated STV0119A (video encoder)
Eval. Board EVAL110		Available now	
Industrial	Dx 66,75,80 DX2-120	Sampling	TFT, Cardbus, Local Bus, I/O integrated
Eval. Boards: ***EVAL200PC (ISA)*** ***EVAL200EM (Local Bus)***		available in April	