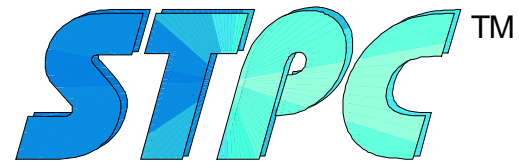




The Embedded PC seminar, Paris 26/10/99



Another "System-On-Chip" from ST

AGENDA

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

Thierry SEIGNEURIE
Product marketing

STMicroelectronics

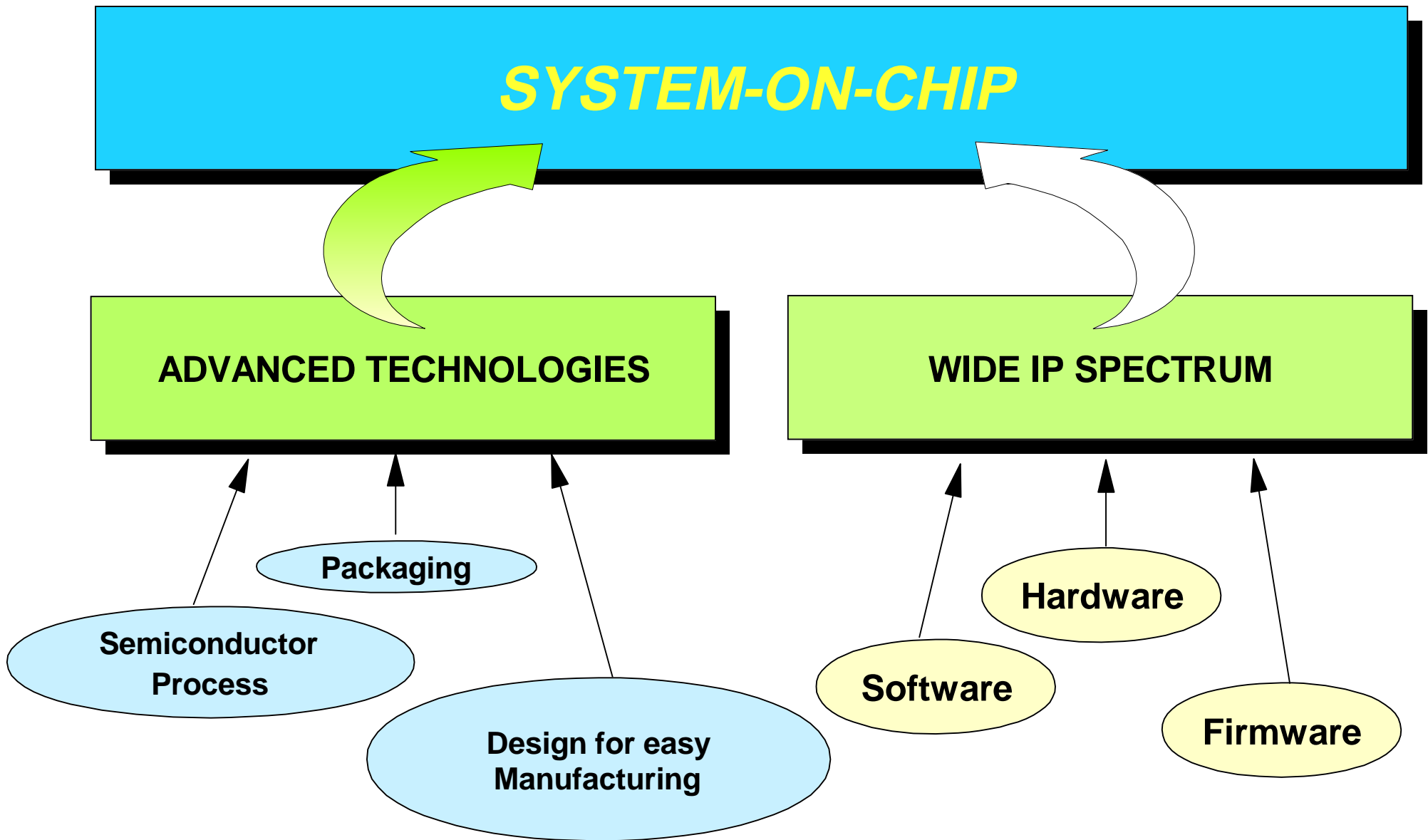
STPCTM *Business Concept*

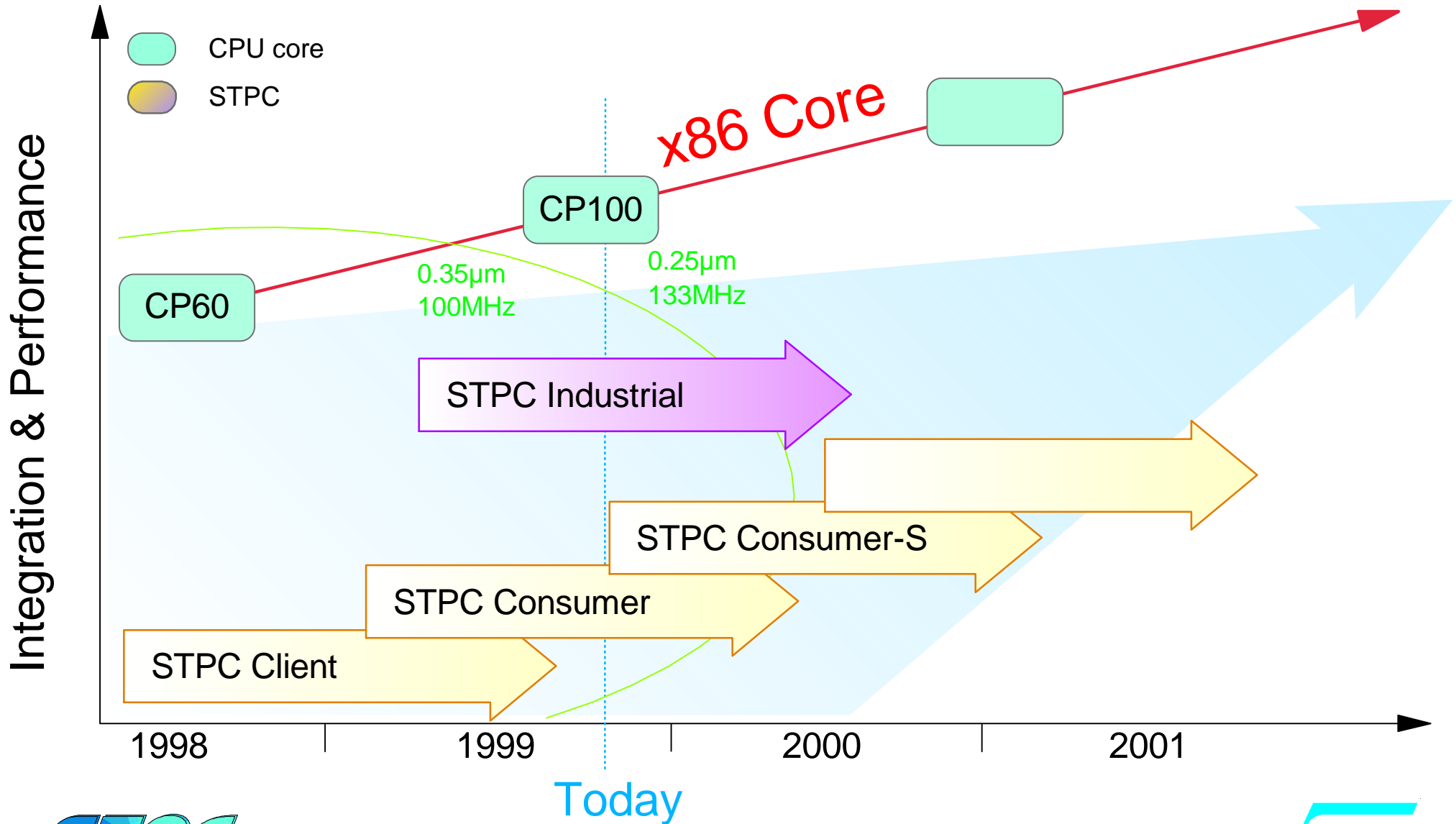
- STPC is a family of embedded microprocessors that combine :
 - a powerful x86 Core
 - a selection of peripheral cells

- STPC does not compete with a standard PC solution, rather extends the PC architecture value into new applications

- Focusing on low cost information and multimedia appliances

How to reach "System-on-Chip"

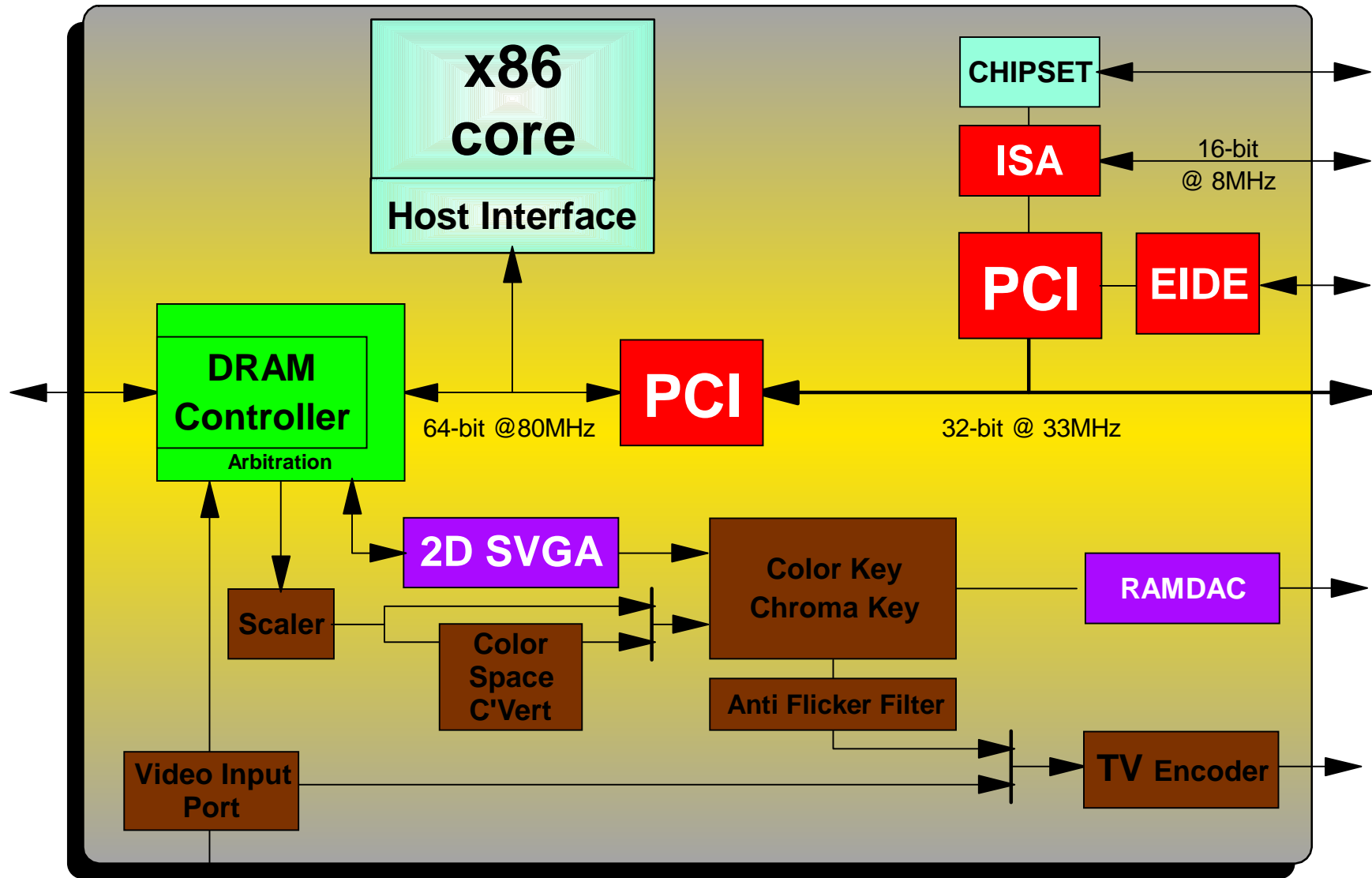




STPC™ Consumer Key Features

- 32-bit 5 stage pipeline x86 core with L1 cache
- 64-bit DRAM controller
- 64-bit 2D accelerator
- VGA controller with RAMDAC
- Video-Input-Port
- TV output with programmable 3-tap flicker filter
- PAL or NTSC output on CVBS, S-Video, RGB supported
- PCI controller
- ISA controller
- DMA and IRQ controller
- EIDE
- Power Management Unit
- Supports industrial temperature range (Tcase = -40 ~ +100 C)
- 388 Ball Grid Array

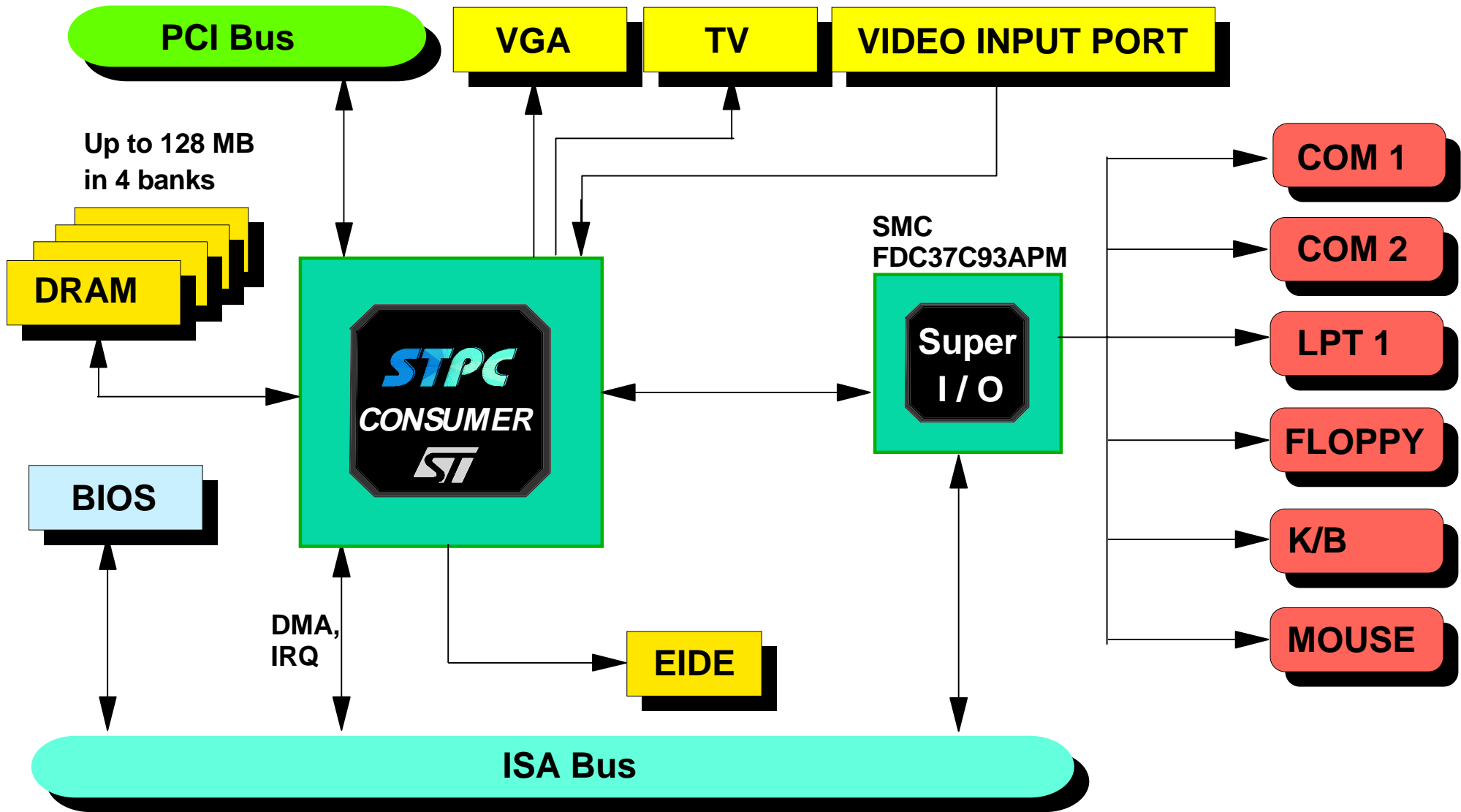
STPC™ Consumer Architecture



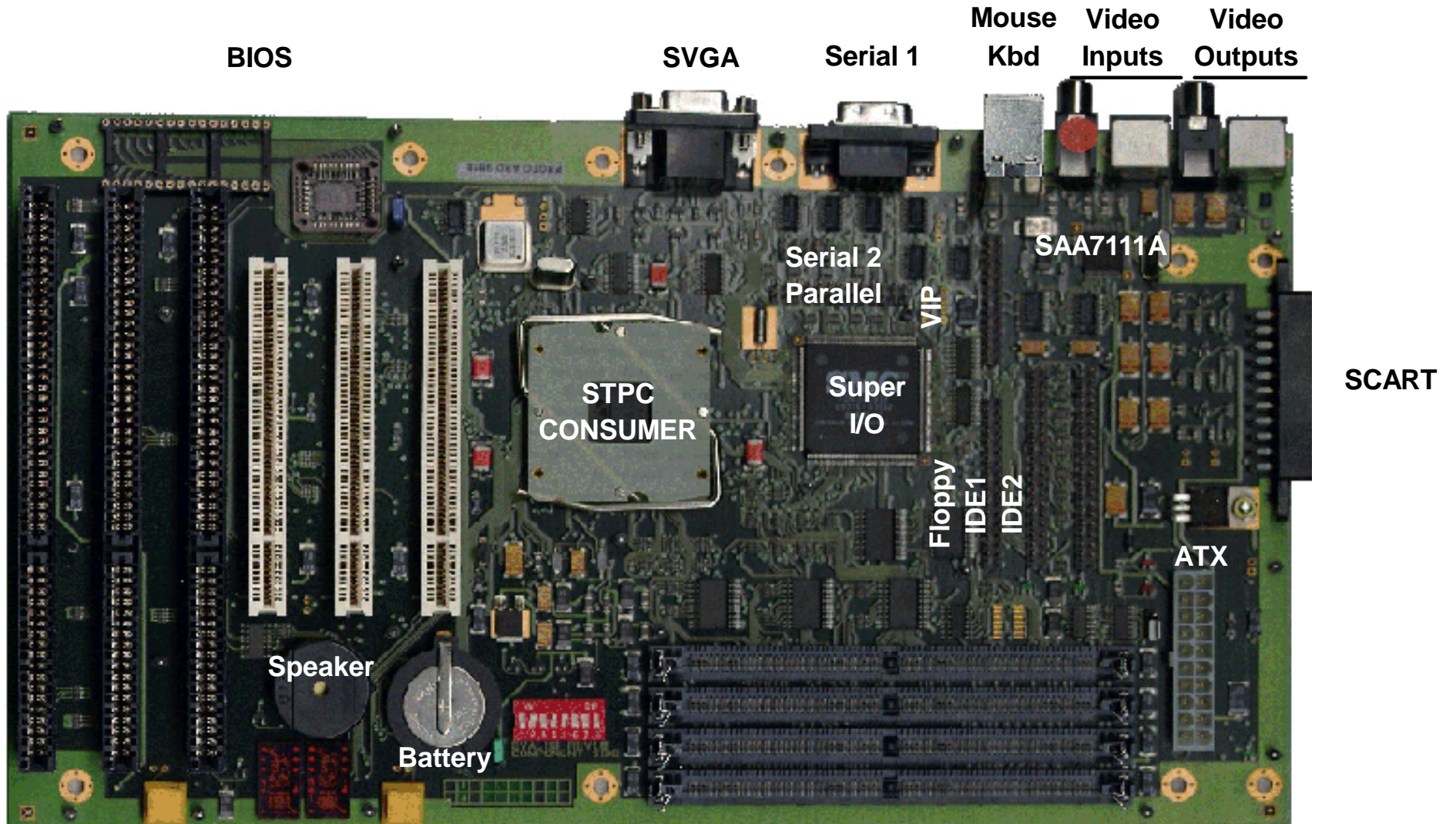
Video Stream



STPC™ Consumer Block Diagram



CONSUMERBD



POST
Display

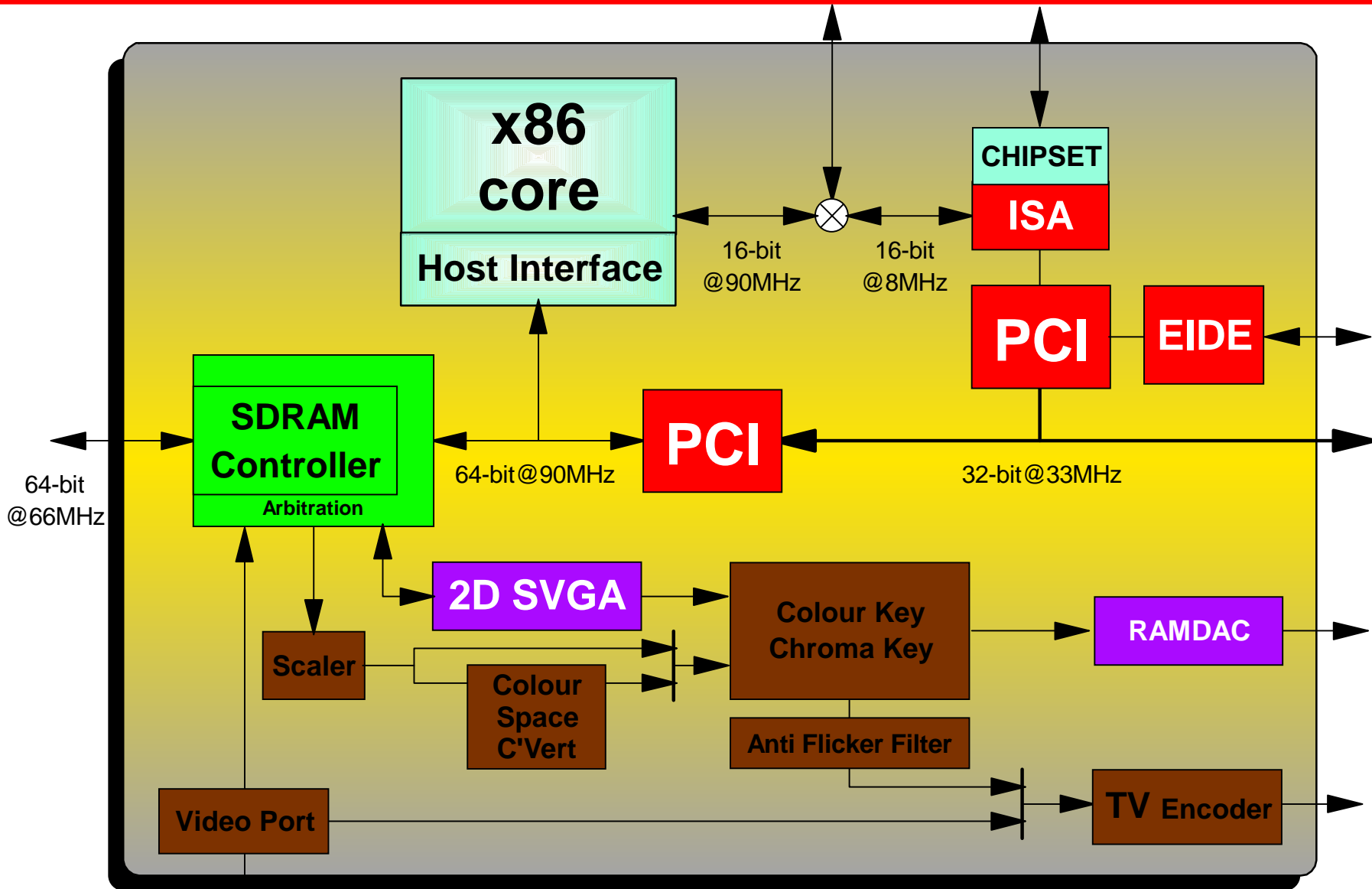


STPC™ Consumer-S Key Features

- ▣ = STPC CONSUMER
 - + SDRAM CONTROLLER
 - + Independent Memory Clock
 - + Improved internal architecture
 - + Local Bus (shared with ISA bus)
- ▣ Supports industrial temperature range (Tcase = -40° ~ +100°C)
- ▣ 388 Ball Grid Array
- ▣ 3.3V Operation

- ▣ Will be available in 0.25µm by mid-2000
- ▣ 2.5V core
- ▣ Pin compatible except the 2.5V power pins
- ▣ A.N. explaining how to design for easy migration

STPC™ Consumer-S

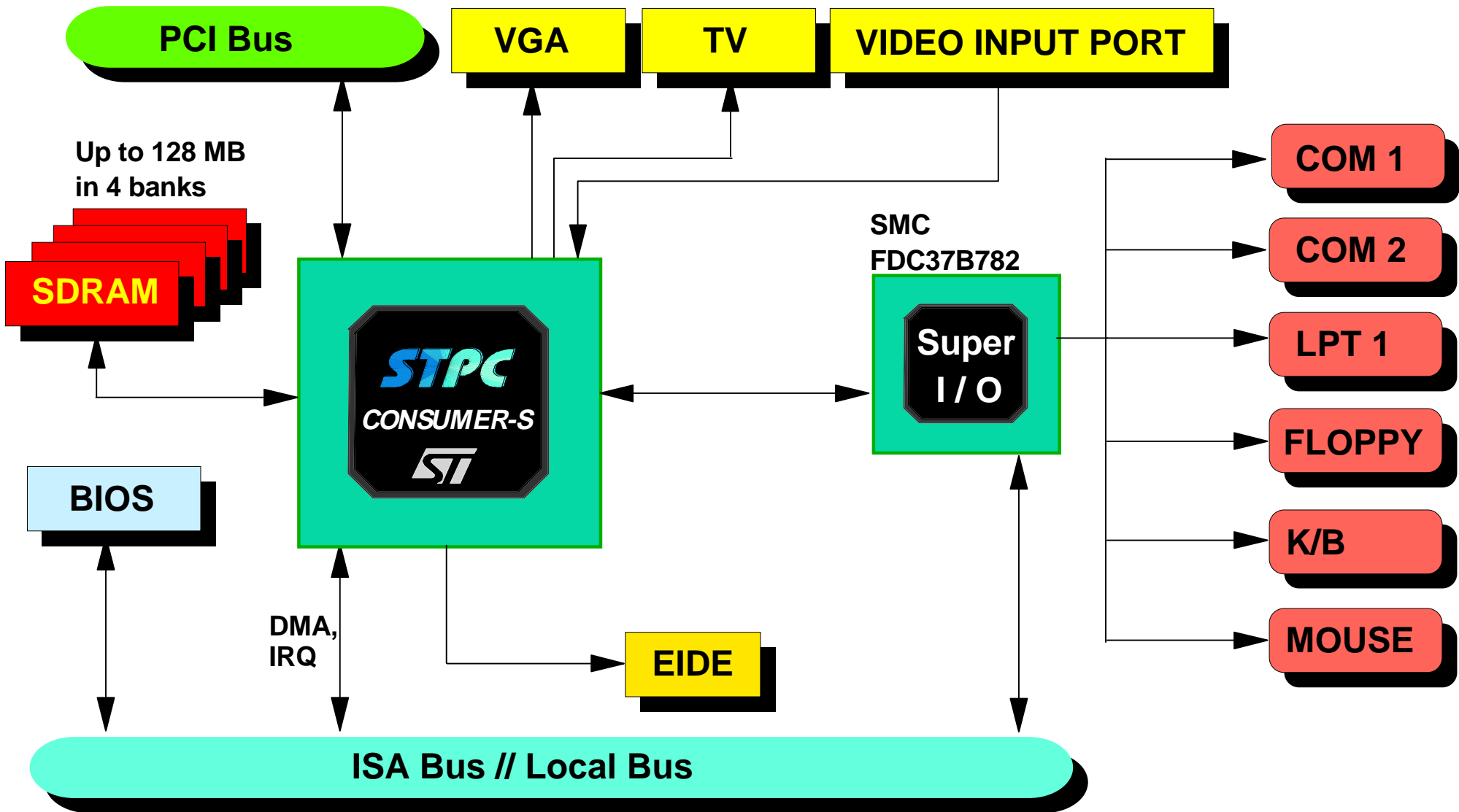


Video Stream

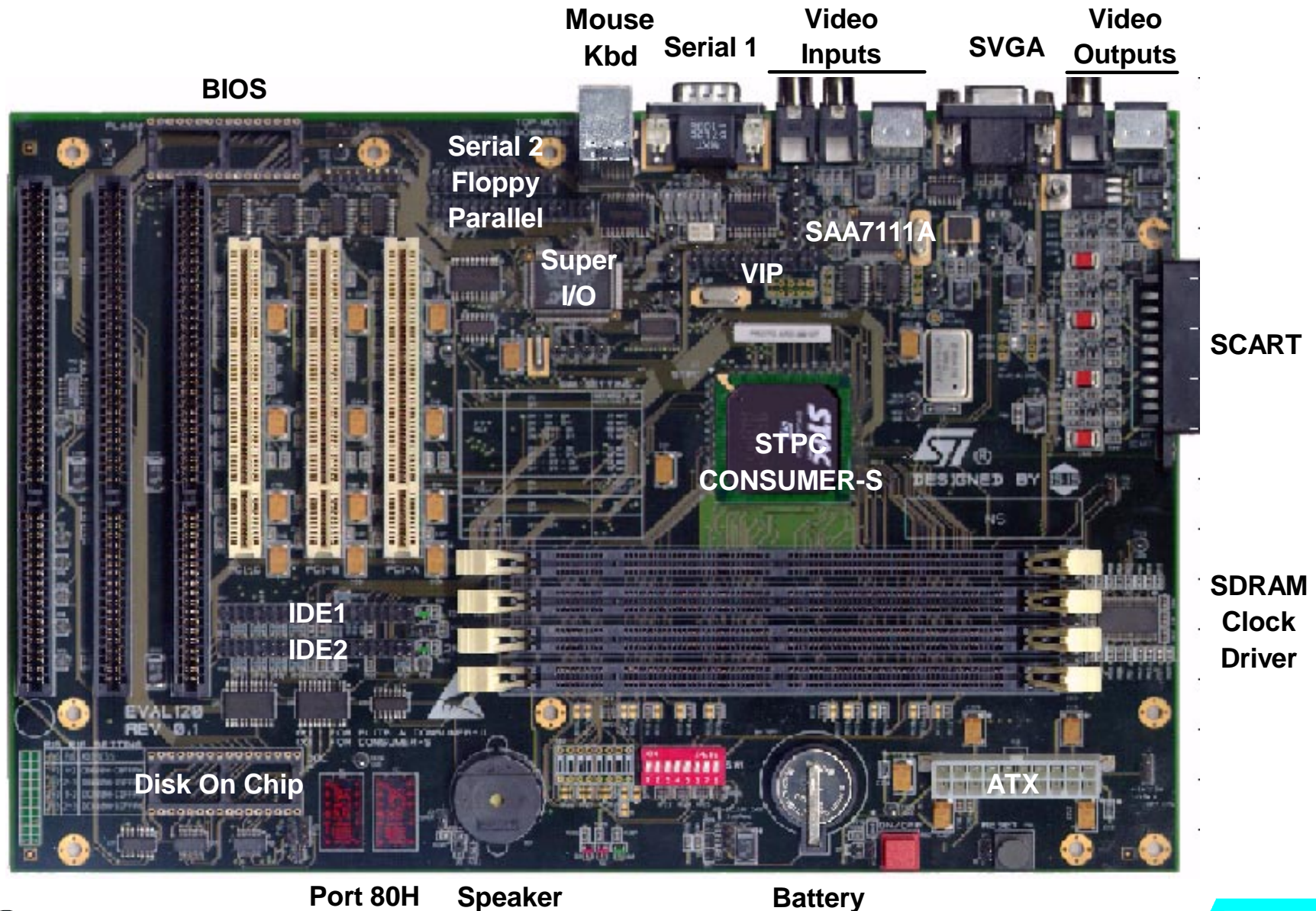
⊗ : Multiplexor














STPC™ Consumer-S Block Diagram



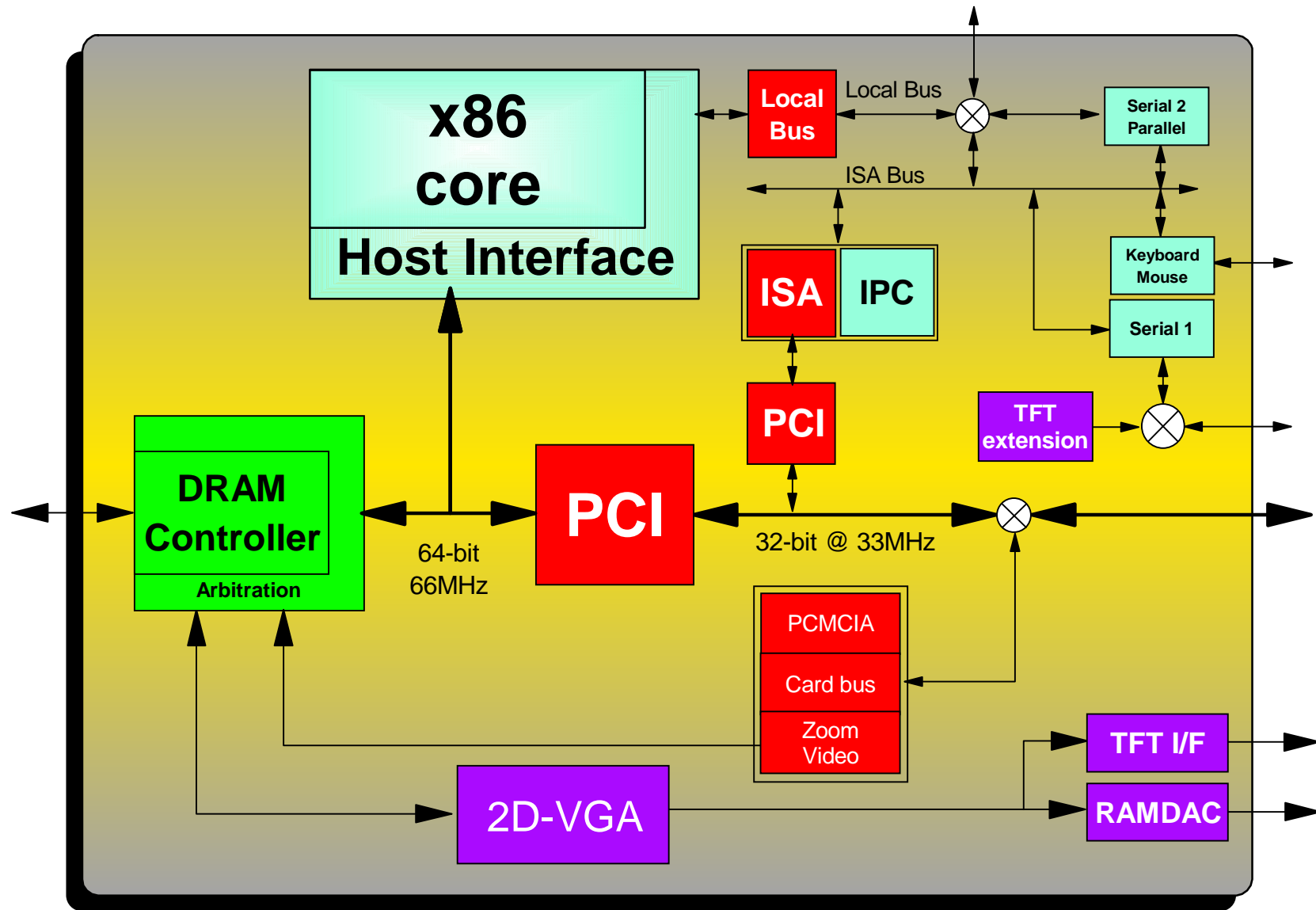
CONSUMERSBD



STPCTM *Industrial* Key Features

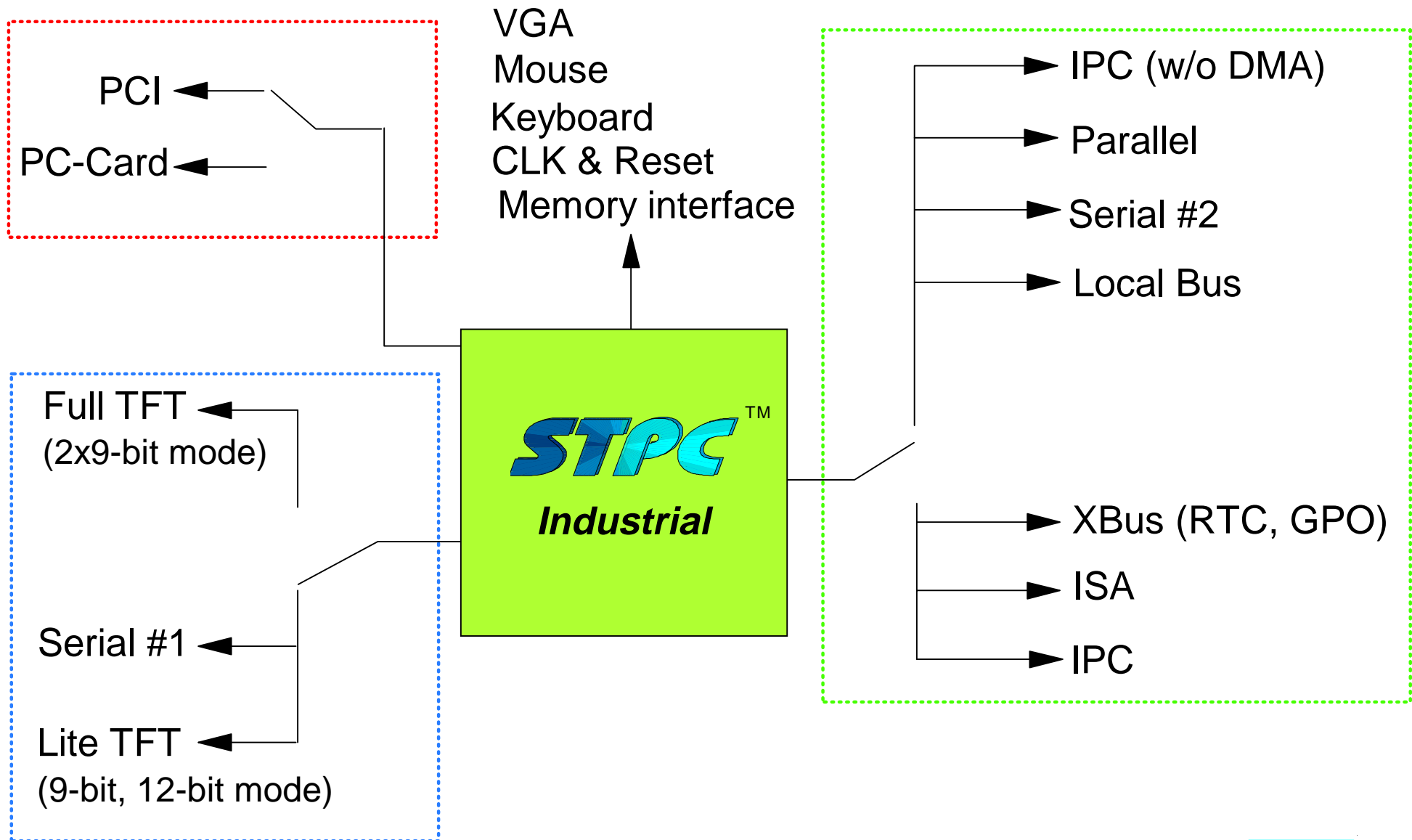
-  32-bit 5 stage pipeline x86 core with L1 cache
-  64-bit DRAM controller
-  64-bit 2D accelerator
-  VGA controller with RAMDAC
-  TFT controller
 - ✓ 1 pixel per clock with 9, 12, 18-bit interface
 - ✓ 2 pixels per clock with 2 x 9-bit interface
-  PC Card / Cardbus interface
-  Low latency Local bus
-  Keyboard, Mouse, 2 Serials, Parallel
-  PCI and ISA controller
-  Supports industrial temperature range (-40 ~ +100 C)
-  388 Ball Grid Array

STPC™ Industrial Architecture

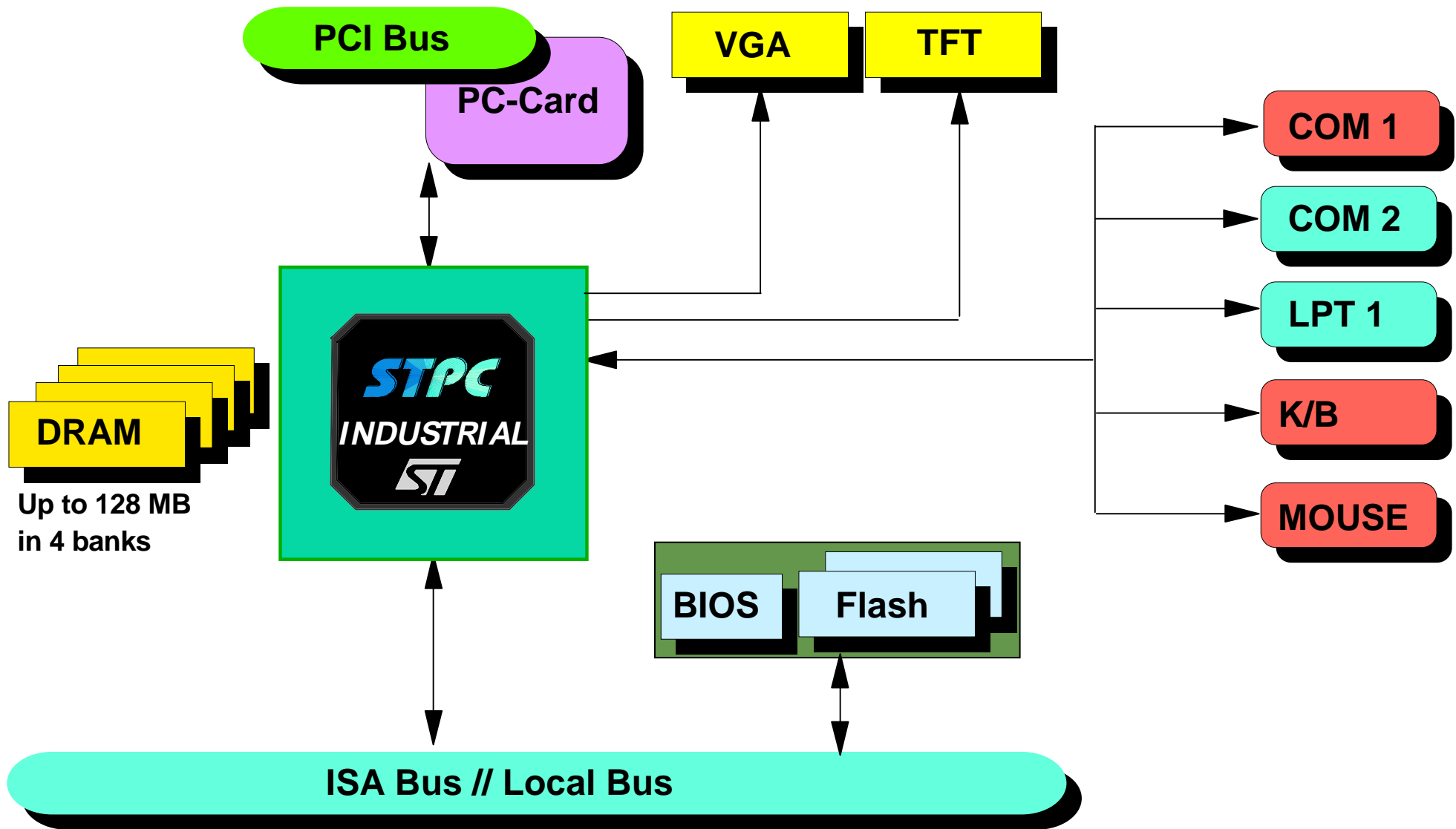


⊗ : Multiplexor

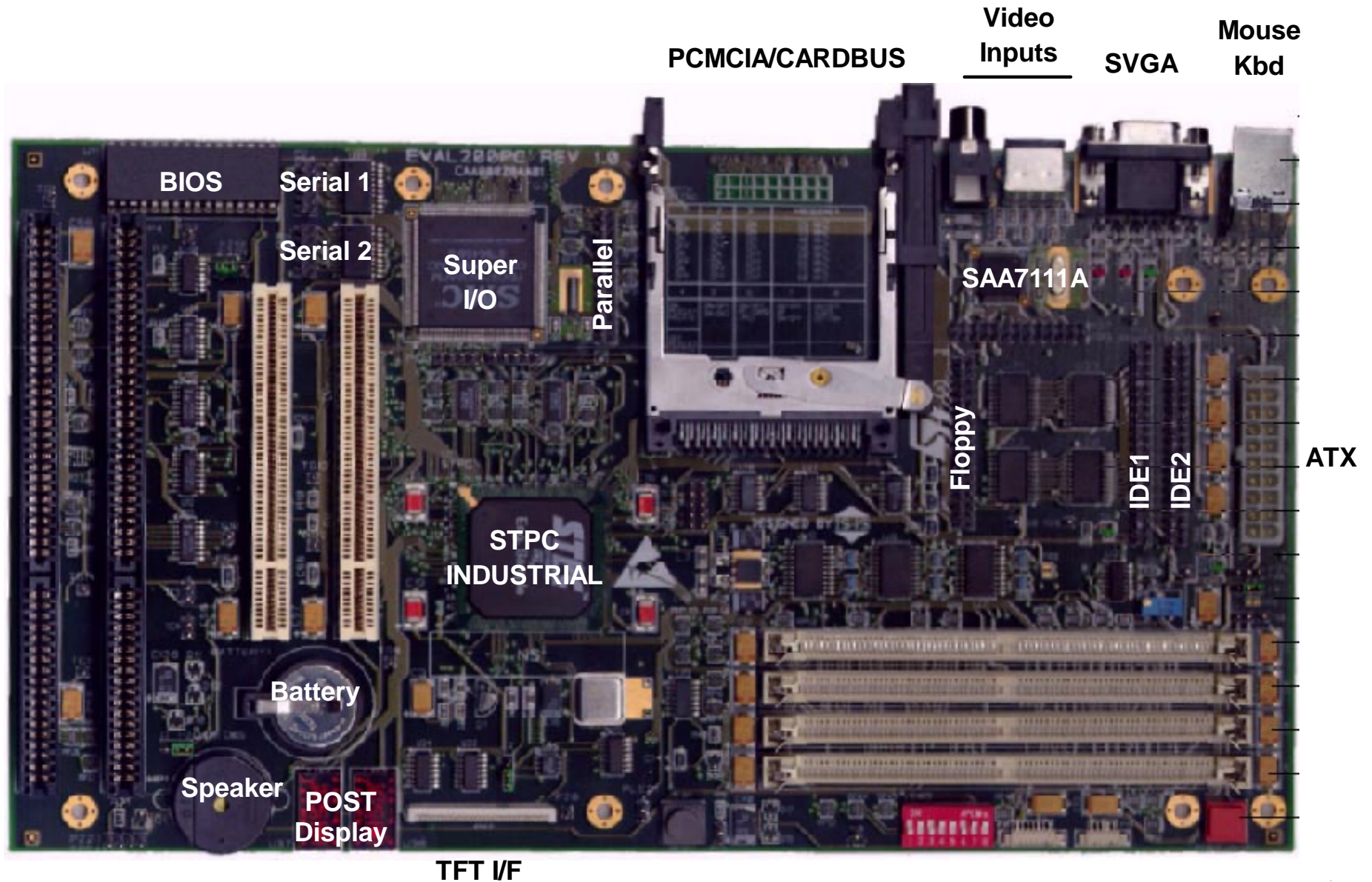
STPC™ Industrial Feature Selection



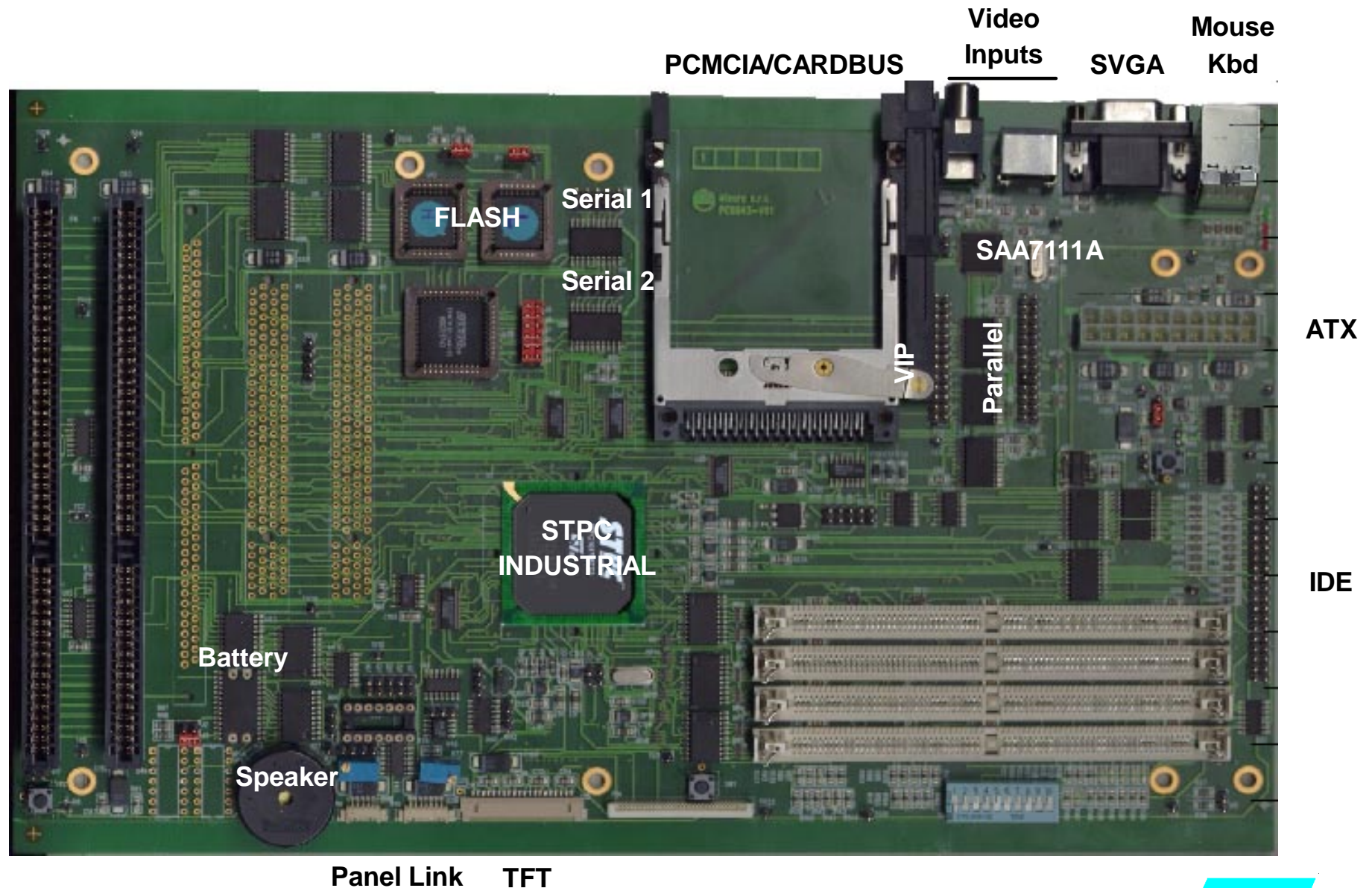
STPC™ Industrial Block Diagram



STPCTM Industrial Board / ISA mode



STPC™ Industrial Board / LB mode



Enabling the *STPC*TM Solution

- Datasheets
- Programming Manual
- Evaluation boards with full functionality
- Hardware Reference Design
- Application Notes
- Evaluation BIOS
- BIOS Writers Guide
- Drivers Writers Guide
- Drivers available for various OS
- Graphics modes Writer's Guide
- Web



<http://www.st.com/stpc>

What Operating System for the **STPC**TM ?

Any PC compatible Operating Systems & RTOS !!!

- Windows CE, Windows 3.1/95/98/NT
- QNX
- Linux
- DOS, Embedded DOS
- VxWorks
- OS9
- Winlight
- Java OS
- NC Operating System
- etc...



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

● Free Graphic Bios (Binary form only)

- ✓ By/from ST based on Elpin sys inc.

Embedded BIOS support

● BIOS Writer's Guide

● Initialization code

Software support - OS strategy

Drivers provided by ST

- Includes all drivers, all features, free of charge

- ✓ DOS
- ✓ Windows 95/98
- ✓ Windows CE
- ✓ Windows NTE Q4/1999
- ✓ Linux Q4/1999

Drivers provided by third party

- See Partner for financial details

- ✓ QnX
- ✓ VxWorks
- ✓ OS9
- ✓ ...



Functionnality Matrix

	Client	Consumer	Consumer-S	Industrial
CPU Core	CP60	CP60	CP60	CP60
IPC*	X	X	X	X
DRAM I/F	FPM/EDO	FPM/EDO	Synchronous	FPM/EDO
PCI Bus	X	X	X	(X)
ISA Bus	X	X	(X)	(X)
Local Bus			(X)	(X)
PC-Card**				(X)
2D SVGA	X	X	X	X
Video Input	VIP	VIP	VIP	(ZoomVideo)
Video Out	Digital	Analog	Analog	
pal/ntsc Encoder		X	X	
TFT				X
IDE	EIDE	EIDE	EIDE	
Kbd / Mouse				X
Serial				(2)
Parallel				(1)

() Multiplexed with other function

* Integrated Peripheral Controller (DMAC, Timer, PIC)

** PC-Card consists in PCMCIA, CARDBUS, and ZoomVideo



STPCTM Availability

Devices	Speed (MHz)	Status	Remarks
STPC Client	C: 66, 75 I: 66, 75	Production	1st STPC device
Eval. board		Available now	
STPC Consumer	C: 66, 80 I: 66, 80	Production	Integrated video encoder
Eval. Board		Available now	
STPC Consumer-S	C: 66, 90 I: 66	Sampling 11/99	SDRAM Interface
Eval. Board		Avail. end 11/99	
STPC Industrial	C: 66, 80 I: 66, 80	Production	TFT, PC-Card, Local Bus, I/Os
Eval. Boards: INDUSPCBD (ISA) INDUSEMBD (Local Bus)		Available now	

