



STB0210x Digital Set-Top Box Integrated Controllers

Highlights

Enable economical solutions for digital video broadcasting (DVB), digital recording and video delivery systems

Provide design flexibility

Help our customers:

- **Improve time-to-market**
 - **Reduce software development cycle**
-

Single-chip controllers enable more capable STB products

IBM STB0210x digital set-top box integrated controllers provide single-chip solutions for mainstream DVB, digital recording and video delivery applications, including video on demand and interactive electronic program guides. New members of IBM's family of STB products, these controllers incorporate an IBM PowerPC 401™ processor within IBM's STB architecture. Featuring IBM Blue Logic™ technology and manufactured using IBM's advanced 0.25-micron process, the STB0210x controllers incorporate four powerful subsystems — processor, digital audio/video, peripheral and memory interfaces.

The efficient STB0210x controller design makes more MIPS available to STB manufacturers by allowing the base audio and video decoding activities to execute with minimal host processing, while the new IDE interface and anti-flicker-filter

feature allow easier enablement of advanced applications and graphical user interfaces. A unified memory architecture provides configuration flexibility. The advanced features of the IBM STB02100 and IBM STB02101 controllers include:

- Integrated PowerPC 401 processor
- MPEG-2 audio/video decoder
- MPEG-2 transport demultiplexer
- On-screen display controller
- NTSC/PAL digital encoder
- IDE interface, smart card and serial ports

In addition to these features, the STB02101 controller provides Macrovision Copy Protection support.

With STB0210x controllers, manufacturers can deliver cost-effective STB solutions for customers. Further, a common architecture across IBM's PowerPC-based STB product family and IBM's diverse development environment can help expedite the design process. Code compatibility between family members allows designers to create a full range of end products with less software development effort. The development environment, including tools, evaluation systems and software enablement, can help manufacturers bring next-generation interactive STB solutions to market rapidly.

PowerPC 401 delivers high performance

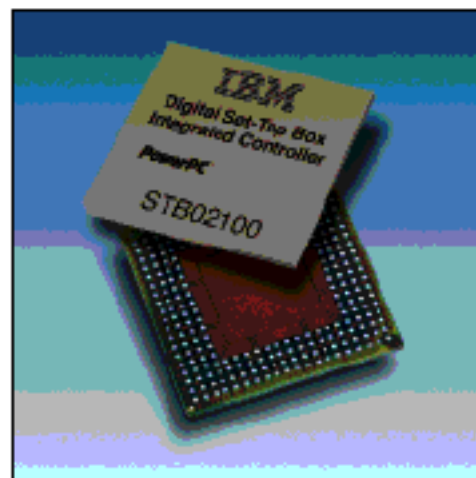
The PowerPC 401 processor, the heart of the *processor subsystem*, features operation at 54 MHz, a 16-KB instruction cache and an 8-KB data cache to

maximize overall application performance. With this processing capability, products can efficiently support electronic programming guides, digital recording and other applications.

Digital audio and video capabilities support next-generation applications

The *digital audio and video subsystem* delivers high-quality video and sound, enabling service providers to offer graphically rich user interfaces for next-generation applications. The digital audio and video subsystem incorporates:

- MPEG-2 video decoder with anti-flicker filter and five on-screen display (OSD) video planes
- MPEG-2 transport and DVB descrambler
- MPEG-2 audio decoder
- Digital encoder, including NTSC/PAL analog conversion, six concurrent analog video outputs and compatibility with SCART connectors



Single-chip controllers enable value-add STB products.



Specifications	IBM STB02100 & IBM STB02101
Performance	54 MHz / 57 MIPS
Technology	0.25- μ m CMOS
Supply voltage	2.5 V and 3.3 V (supports 3-V and 5-V I/Os)
Power dissipation	21 watts (nominal)
Operating temperature range	0° C to 70° C (ambient)
Package	352-pin, 35-mm PBGA

- Macrovision Copy Protection support (STB02101 controller only; note: a Macrovision license is required)
- Audio PLL

Peripheral interface choices and memory interface provide design flexibility

The *peripheral interface subsystem* provides the range of interfaces designers need to meet customer requirements:

- General purpose timers, pulse width modulation (GPT, PWM)
- Smart Card interface (SCI)
- Inter-integrated circuit (I²C) interface
- UART interface (16550)
- Serial and infrared communications controller (SICC)
- Serial control port
- Modem I/F
- General purpose input/output (GPIO) controllers

The *memory subsystem* includes an SDRAM interface with up to 16 MB, up to 128 MB of SRAM, ROM or FLASH, a 4-channel DMA and an IDE interface.

Highly productive development tools help speed time-to-market

Evaluation kits, including source code, a circuit board and debug/compiler tools, are available to help improve manufacturers' time-to-market. IBM offers Microsoft® Windows®98 hosted development tools, such as a C/C++ compiler and the RISCWatch debugger for non-invasive, RTOS-aware debug. Additionally, the PowerPC 401 processor's widely adopted and scalable architecture is supported by the IBM PowerPC™ Embedded Tools Program, giving designers access to third-party tools to meet various development needs.

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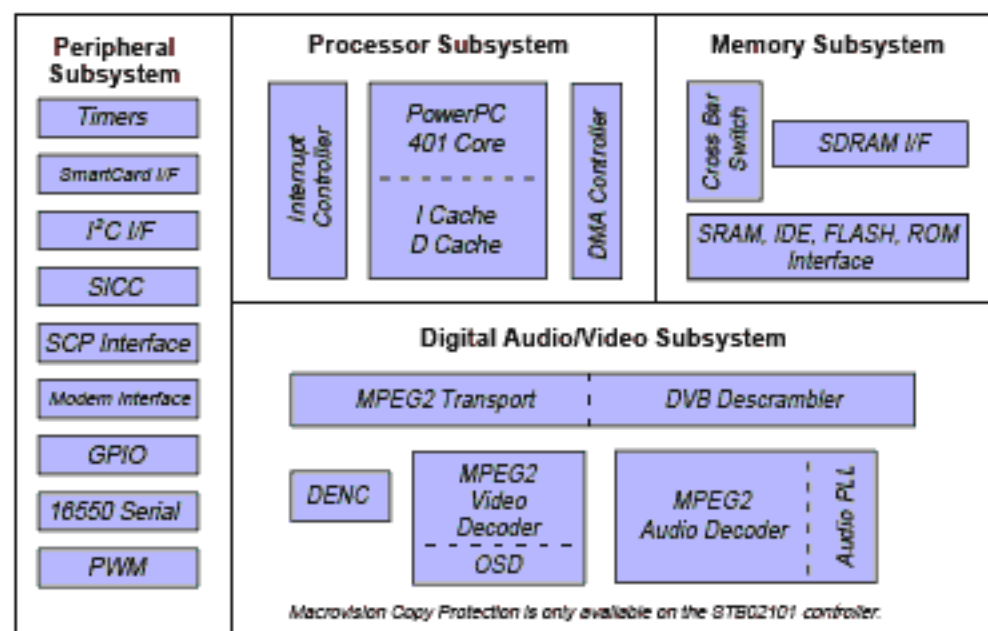
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IBM Microelectronics Division
1580 Route 62, Bldg. 604
Hopewell Junction, NY
12533-6951

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IBM STB0210x block diagram



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