IBM

STB03xxx Digital Set-Top Box Integrated Controllers

Support emerging set-top box (STB) applications, including e-commerce, Web browsing, Java™ applets and HDD

Provide design flexibility

Help our customers:
- **Improve time-to-market**
- **Reduce software development cycle**
- **Increase product longevity**

Single-chip controllers enable advanced STB products

IBM STB03xxx digital set-top box integrated controllers provide single-chip, high-performance solutions for digital video broadcasting (DVB), digital recording, and demanding video delivery applications, including interactive Web browsing. New members of IBM's family of STB products, these advanced controllers incorporate an IBM PowerPC 405™ processor within IBM's STB architecture. Featuring IBM Blue Logic™ technology and manufactured using IBM's advanced 0.25-micron process, the STB03xxx controllers incorporate four powerful subsystems — processor, digital audio/video, peripheral and memory interface. The efficient STB03xxx controller design makes more MIPS available to STB manufacturers by allowing the base audio and video decoding activities to execute with minimal host processing. A unified memory architecture provides configura-

tion flexibility. The advanced features of STB03xxx controllers include:

- Integrated PowerPC 405 processor
- MPEG-2 audio/video decoder
- Dolby® Digital audio decoder option* (IBM STB0321x and STB0341x only)
- MPEG-2 transport demultiplexer
- On-screen display controller
- NTSC/PAL digital encoder
- IDE interface for hard disk drive (HDD), smart card, parallel and serial ports

Design flexibility supports diverse applications

Designers have the flexibility to choose from a range of STB03xxx controllers to satisfy their individual application requirements. They can choose a controller with an embedded PowerPC 405 featuring either 150-MIPS or 225-MIPS performance. In addition, they have the flexibility to select a controller with Macrovision Copy Protection support, Dolby Digital audio support or both. The new IDE interface and anti-flicker-filter feature allow easier enablement of digital video recording and Web browsing applications.

PowerPC 405 delivers high performance

The PowerPC 405 processor, the heart of the *processor subsystem*, features high-speed operation at 108 MHz or 162 MHz, a 16-KB instruction cache and an 8-KB data cache to enhance overall application performance. With this processing capability, products can support electronic programming guides, e-commerce applications, Web browsing and other interactive 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 interactive applications. The digital audio and video subsystem incorporates:

- MPEG-2 video decoder with anti-flicker filter and five on-screen display (OSD)/ video planes; decodes MPEG-2 Main Profile at Main Level (MP @ ML) video
- MPEG-2 transport and DVB descrambler
- MPEG-2 audio decoder; decodes MPEG-2 Layer I & Layer II (CD quality) audio
- Dolby Digital-compliant decoding (IBM STB03x1x controllers only; a Dolby Digital license is required)
- Digital encoder, including NTSC/PAL analog conversion, six concurrent analog video outputs and compatibility with SCART connectors

STB03xxx controllers provide single-chip, high-performance solutions.

Specifications	IBM STB034xx[†]	IBM STB032xx[†]
Performance	162 MHz / 225 MIPS	108 MHz / 150 MIPS
Technology	0.25-μm CMOS	
Supply voltage	2.5 V and 3.3 V (supports 3-V and 5-V I/Os)	
Power dissipation	2.5 watts (nominal)	
Operating temperature range	0° C to 70° C (ambient)	
Package	304-pin, 31-mm PBGA	

[†]*Dolby Digital is supported by STB0341x and STB0321x. (Dolby Digital license required.)*
Macrovision is supported by STB034x1 and STB032x1. (Macrovision license required.)

- Macrovision Copy Protection support (STB03xx1 controllers only; note: a Macrovision license is required)
- Audio PLL

Choose from a wide range of peripheral and memory interfaces

The *peripheral interface subsystem* provides the range of interfaces designers need to meet customer requirements:
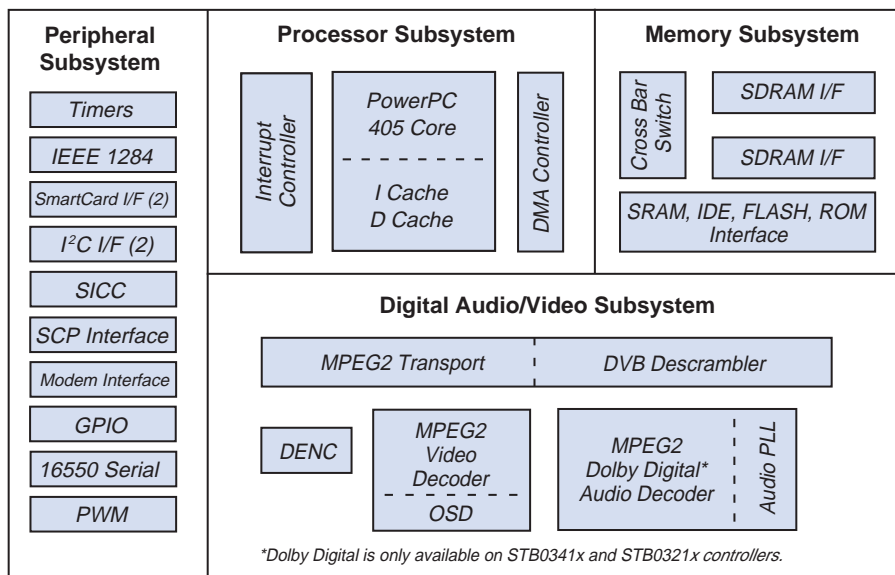
- General purpose timers, pulse width modulation (GPT, PWM)
- IEEE 1284 peripheral interface
- Two Smart Card interfaces (SCIs)
- Two inter-integrated circuit (I²C) interfaces
- UART interface (16550)
- Serial and infrared communications controller (SICC)
- Serial control port
- Modem I/F
- General purpose input/output (GPIO) controllers

The *memory subsystem* includes two SDRAM interfaces with up to 16 MB each, 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 Microsoft® Windows®98 hosted development tools, such as a C/C++ compiler and RISCWatch debugger for non-invasive, RTOS-aware debug, are available to help improve manufacturers' time-to-market. Additionally, the PowerPC 405 processor's widely adopted and scalable architecture is supported by the IBM PowerPC™ Embedded Tools Program, enabling designers to have access to third-party tools to meet various development needs.

For more information, visit our Web site at *www.chips.ibm.com*.

IBM STB03xxx block diagram