

High performance and faster time-to-market



Digital Set-Top Box Integrated Controllers

Highlights

Single-chip solution that delivers more usable MIPS

The IBM® STB010xx family of digital set-top box (STB) integrated controllers provides high-performance, attractively priced, single-chip solutions for DVB and advanced television STB applications. Featuring state-of-the-art IBM Blue Logic™ technology, these integrated chips implement the powerful IBM STB architecture, which minimizes the workload of the on-chip PowerPC 401™ processor. This efficient design makes more MIPS available for interactive services, allowing manufacturers to lengthen the service life of their products. Advanced on-chip communication increases performance, while a unified memory architecture provides configuration flexibility.

The full-featured STB010xx controllers support a wide range of applications with powerful capabilities:

- Integrated PowerPC 401
- MPEG audio/video decoder
- Dolby® Digital audio decoder (IBM STB0101x only)
- MPEG-2 transport demultiplexer
- On-screen display controller
- NTSC/PAL digital encoder
- Smart card, parallel, and serial ports

Advanced technology for audio, video, and graphics

Manufactured using IBM's advanced CMOS 5SE (0.35- μm) process, the IBM STB010xx controllers deliver audio, video, and graphics while supporting fast response to user requests. In addition, an efficient design allows the base audio and video decoding activities to execute with minimal host processing. All STB010xx family members provide MPEG-2 audio decoding. The IBM STB0101x also offers Dolby Digital capabilities.

The STB010xx controllers incorporate four major subsystems — processor, digital audio/video, peripheral, and memory interface.

The *processor subsystem* performs all initialization and control functions and executes required software. The PowerPC 401 processor, the heart of this subsystem, offers 49.5 MHz speed and a widely adopted and scalable architecture that is supported by IBM and third-party tools.

The *digital audio and video subsystem* delivers the high-quality video and sound that consumers expect from advanced digital television. This means that service providers can offer graphically rich user interfaces for next-generation interactive applications, such as video-on-demand, electronic program guides, and electronic commerce. Key features of the digital audio and video subsystem include:

- MPEG-2 video decoder and multi-plane on-screen display (OSD) — provides MP@ML video playback with multi-plane OSD and image scaling for sharp resolution and graphically rich user interfaces.
- MPEG-2 transport and DVB descrambler — accepts 100 Mb/s parallel (88 Mb/s with descrambler) or 60 Mb/s serial data, providing compatibility with a DVB synchronous parallel interface.
- MPEG-2 audio decoder — provides MPEG-2 layer 1 and 2 decoding for digital sound clarity. It also features Dolby Digital-compliant decoding with 5.1 channel output for rich digital surround sound. (A Dolby Digital license is required.)
- Digital encoder — offers design flexibility through NTSC/PAL analog conversion, five concurrent analog video outputs, and compatibility with SCART connectors. Optional support for Macrovision Copy Protection safeguards digital media. (A Macrovision license is required.)
- Audio PLL — generates all required audio clocks and automatically synchronizes playback.



IBM's attractively priced STB controllers deliver high performance in a single chip.



Specifications for STB010xx*

CPU core performance	49.5 MHz
Technology	0.35 μm CMOS
Supply voltage	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 available only on STB01010 and STB01011. (Dolby Digital license required)
Macrovision is available only on STB01000 and STB01010. (Macrovision license required)

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Printed in the United States of America 9-99

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

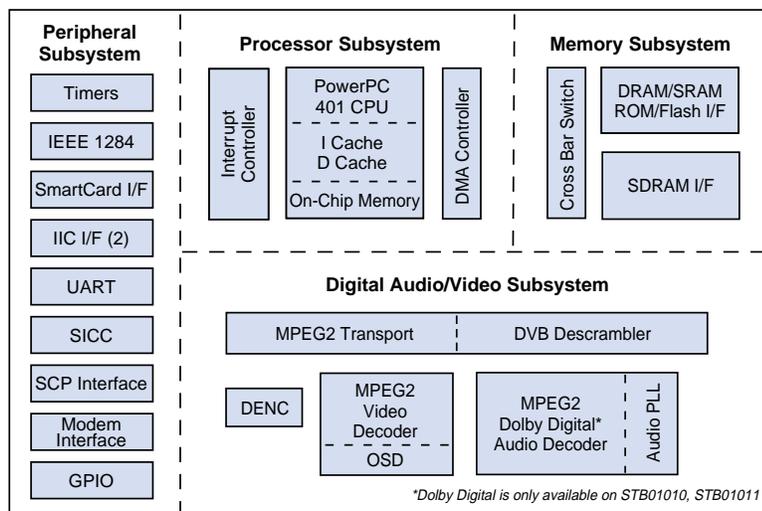
- IEEE 1284 peripheral interface
- Smart card interface (SCI)
- Two inter-integrated circuit (I²C) interfaces featuring 100 KHz and 400 KHz operation
- UART interface (16450/16550)
- Serial and infrared communications controller (SICC), supporting RS-232 and infrared communications
- Service control port, providing a glueless serial interface to many microcontrollers
- Modem codec I/F (serial port), featuring a glueless interface to telephony codec chips
- General purpose input/output (GPIO) controllers

The *memory subsystem* enables configurations that best satisfy application requirements. The subsystem's two memory interfaces support up to 16 MB of SDRAM, 128 MB of DRAM, and up to 40 MB of SRAM, ROM, and FLASH Memory.

Support geared to your development needs

Evaluation kits, including source code, a circuit board, and debug/compiler tools, are available to improve your time-to-market. IBM offers Microsoft® Windows®95 hosted development tools, such as a High C/C++ compiler and the RISCWatch debugger for non-invasive, RTOS-aware debug. Additionally, through the IBM PowerPC Embedded Tools Program, you have access to hundreds of third-party tools to meet your specific development needs.

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



IBM STB010xx functional blocks



G522-0368-01