

# Bt864A/865A

## Digital Video Encoder

### High Performance YCrCb to NTSC/PAL Digital Video Encoders

Conexant's Bt864A and Bt865A are designed for video systems that require the generation of high-quality composite, Y/C (S-video) or RGB (SCART) video signals from an 8- or 16-bit YCrCb video stream. Worldwide video standards are supported, including NTSC-M (N. America, Taiwan, Japan), PAL-B,D,G,H,I (Europe, Asia), PAL-M (Brazil), PAL-N (Uruguay, Paraguay), and PAL-Nc (Argentina).

The Bt864A and Bt865A are pin-compatible and functionally identical, except the Bt865A can also output the Macrovision™ version 7 anticopy algorithm. Either master or slave mode operation may be implemented to provide the highest video performance when interfaced with any MPEG decoder. CCIR 601 or square pixel video signals may be input to provide maximum flexibility in the system architecture.

The Bt864A/865A and other Conexant video encoders have been designed into numerous high-performance and high-volume consumer applications worldwide. These include satellite set-top boxes, DVD players, PC add-in kits, digital cameras, video CD players, video conferencing systems and other applications that demand the highest quality video.



### Distinguishing Features

- 8- or 16-bit 4:2:2 YCrCb inputs
- NTSC-M/PAL/PAL-M/PAL-N/PAL-Nc video outputs
- S-video/RGB (SCART)/CVBS outputs
- CCIR 601 or square pixel operation
- 2x oversampling
- 10-bit DACs
- Current output DACs for the highest

# Bt864A/865A

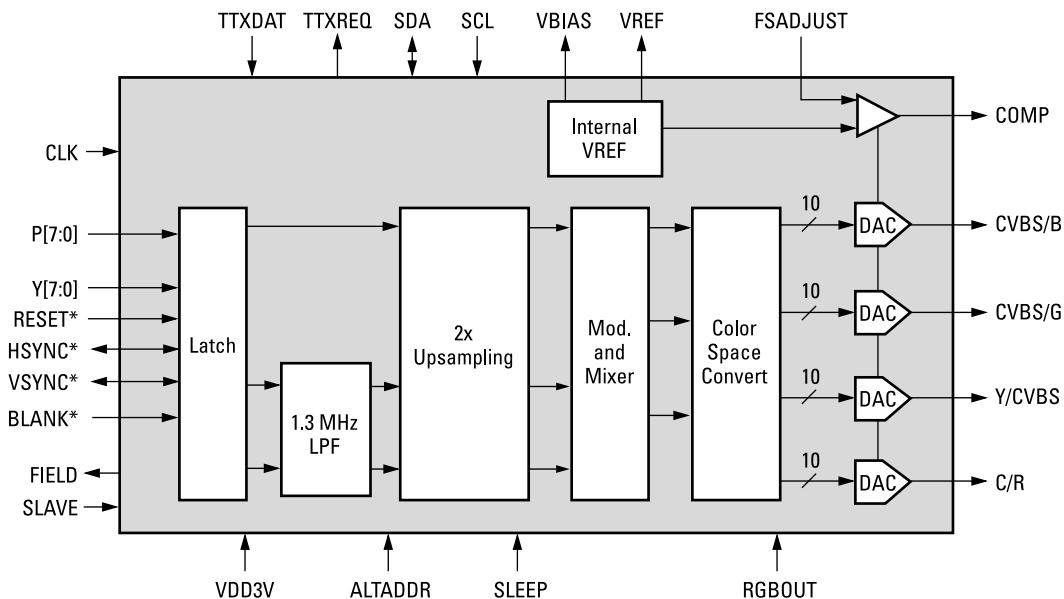
Digital Video Encoder

## Flexible Operation for a Wide Range of Video Systems

High-performance video combined with the right set of features make the Bt864A/865A a versatile device for almost any video system. 10-bit DACs provide the high-resolution video required for modern satellite set-top boxes, DVD players, PC add-in cards, video conferencing systems and digital cameras. Several power conservation modes extend portable system battery life and help to reduce system heating.

New televisions and media, which make use of wide screen 16:9 aspect ratios, are also supported by the Bt864A/865A to provide the best flexibility, performance and functionality.

The Bt864A/865A accepts video data in a variety of ways: CCIR 601, NTSC, and PAL square pixel formats. This provides system designers with maximum flexibility. Either 3.3V or 5V operation is possible with the Bt864A/865A to permit operation within any system environment. Horizontal sync and vertical sync may be configured as inputs (slave mode) or outputs (master mode). In addition to the normal blanking which occurs during Hsync and Vsync, blanking may be externally controlled during active video. The rise and fall times of sync, the burst envelope, and closed caption data are internally controlled.



Functional block diagram



Analog luminance (Y) and chrominance (C) information is available on the Y and C outputs for interfacing to S-video equipment. The composite analog video signal is output simultaneously onto two outputs. This enables two simultaneous baseband composite video signals, or one output, to provide baseband composite video while the other drives an RF modulator. Programmable luminance delay (single-channel) permits the synchronization of both luminance and chrominance when video is transmitted to a television monitor via an RF modulator. Analog RGB is also available to allow for support of the European SCART/PeriTV interface. A two-wire teletext (WST-B) interface is also included in the Bt864A/865A.

Macrovision anticopy circuitry is included in the Bt865A to support DVD and newer set-top box services. The Bt864A is pin and function compatible with the Bt865A to permit video design and testing for applications that do require Macrovision circuitry and those that do not.

### **I<sup>2</sup>C Interface**

Bt864A/865A registers are accessed via a two-wire Inter-Integrated Circuit (I<sup>2</sup>C) interface. Serial clock and data lines (SCL and SDA) are used to transfer data at a rate of 100 Kbps. These lines are used to access and program the internal registers of the device, including the Macrovision registers of the Bt865A. Deactivation of I<sup>2</sup>C communication is possible by asserting sleep or reset modes.

### **Implementation**

The Bt864A/865A is packaged in a 52-pin Plastic Quad Flat Pack (PQFP) with a 14 mm x 14 mm body size. It requires only a minimum of discrete passive support components. It is ideal for low-cost and high-performance video systems and consumer electronics.

## **What is a Video Encoder?**

A video encoder is an electronic integrated circuit (chip) that delivers the signal to your television from a DVD or video CD player, LaserDisc player, cable or satellite TV set-top box, digital camera, video conferencing system, Internet browser or personal computer (PC). It is the chip that makes everyone's favorite shows look bright, crisp, colorful and clear. With today's new digital video systems, TV pictures can look their best when showing movies and sports from DVD and TV set-top boxes.

Video encoder chips today have the functions of four separate chips integrated into one single chip. These chips take the digital video information which is stored on DVD discs or digital camera memory cards, or transmitted to a satellite dish TV receiver or cable tuner box, and convert it into the "old-fashioned" type of signal a TV requires. The video encoder converts digital bits into analog electrical signals, which tell the TV what colors should be shown on the screen and how bright or dark they should be. Better quality video encoder chips produce better quality video and make the images seem more lifelike and exciting.

Video encoder technology has improved rapidly in recent years, allowing people to connect a variety of different video devices to their TVs and create the home entertainment systems of their dreams. These relatively inexpensive devices are one of the most critical components of modern video systems, and they have found widespread usage in business, home office, medical, security, professional video studios, and all types of consumer video applications.

## Product Features

- 8- or 16-bit 4:2:2 YCrCb inputs
- NTSC-M/PAL/PAL-M/PAL-N/PAL-Nc composite video outputs
- S-video/RGB (SCART) outputs
- CCIR 601 or square pixel operation
- 2x oversampling
- 10-bit DACs
- Master or slave video timing
- Auto mode detection function (slave mode)
- Interlaced/noninterlaced operation
- Macrovision 7 support (Bt865A only)
- Closed caption encoding
- Teletext encoding (WST system B)
- I<sup>2</sup>C interface
- On-board voltage reference
- Power-down modes
- 52-pin PQFP package
- Programmable luma delay (single-channel)
- 3.3V or 5V supply voltage
- VARIS-II (16:9) aspect ratio support

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## Applications

- Digital cable systems
- Satellite television set-top boxes (DBS/DSS)
- DVD players
- Video CD players
- Digital cameras
- Video conferencing systems
- PC add-on cards
- PC video editing

## Related Products

- Bt835
- Bt852
- Bt856/857
- Bt860/861
- Bt866/867
- Bt868/869

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