Product Bulletin

TVP5147: 5-Line Comb Filter NTSC/PAL/SECAM Video Decoder
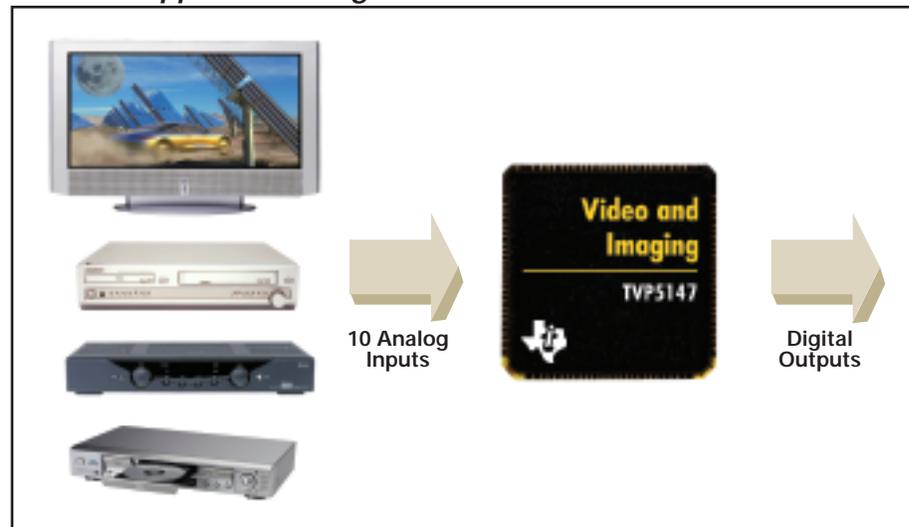
Key Features

- 10-bit, 30-MSPS analog-to-digital converters
- 10 inputs, one shared analog output
- New robust sync detector
- Improved 2D 5-line adaptive comb filter
- VBI data processor
- Macrovision™ copy protection detection
- Pin and software compatibility with TVP5146

Texas Instruments' (TI) new TVP5147 device, a high-quality, high-performance digital video decoder (NTSC/PAL/SECAM) digitizes and decodes all popular baseband analog video formats into digital component video. A low-cost alternative to TI's TVP5146, the TVP5147 is well suited for consumer electronic equipment including:
- Digital TV
- LCD TV and monitor
- DVD-R
- PVR/DVR
- PC video card
- Video capture and video editing
- Video conferencing

The TVP5147 includes two 10-bit, 30-MSPS analog-to-digital converters. Each analog channel contains an analog circuit, which, prior to each converter, clamps the input to a reference voltage and applies a programmable gain and offset. A total of 10 video input terminals can be configured to a combination of CVBS, S-video, or YPbPr video inputs for multisource connection. In addition, one analog output is provided for end equipment that may require output to an external VBI slicing solution.

The device supports analog-to-digital conversion of component YPbPr signals, as well as analog-to-digital conversion and decoding of NTSC, PAL and SECAM composite and S-video into component YCbCr. The new robust sync detector provides high quality support of VCR trick modes, weak and noisy signals as well as other nonstandard video sources.

The TVP5147, as with its predecessor (TVP5146), allows for a single solution for NTSC, PAL and SECAM video systems. With its auto detection and switching algorithm, consumer electronic manufacturers can produce one single design for multiple world-wide regions and video standards. The device is also highly flexible with the ability to be user programmable for many features including:
- 20-bit 4:2:2 YCbCr with separate syncs
- 10-bit 4:2:2 YCbCr with separate syncs
- 10-bit ITU-R BT.656 4:2:2 YCbCr with embedded syncs

CVBS, S-video or YPbPr inputs are sampled at twice the square pixel or ITU-R BT.601 clock frequency, line locked, then decimated to the single pixel rate. Y/C separation is accomplished using an improved 5-line adaptive comb filtering for both the luma

TVP5147 Application Diagram

10 Analog Inputs

Digital Outputs

and chroma data paths to reduce cross-luma and cross-chroma artifacts. A chroma trap filter also is available.

TVP5147 allows for fast-switch input for pixel-by-pixel switching between CVBS and YPbPr. It also features fast-switch input for synchronous switching between digital RGB overlay and any video input for applications using external line-21 decoders.

The user has extensive control with S-video and CVBS inputs. Video characteristics such as contrast, brightness, saturation and hue are controlled through an I²C host port interface. Luma peaking (sharpness) with programmable

gain is included, along with a patented chroma transient improvement (CTI) circuit.

The device features gain (contrast) and offset (brightness) adjustments, along with automatic component video detection.

The TVP5147 includes methods for advanced vertical blanking interval (VBI) data retrieval. The VBI data processor (VDP) slices, parses and performs error-checking on Teletext, closed caption and other VBI data formats. A built-in FIFO stores up to 11 lines of Teletext data and full-screen Teletext retrieval is possible with proper host port synchronization. VBI data can be retrieved via I²C or as ancillary
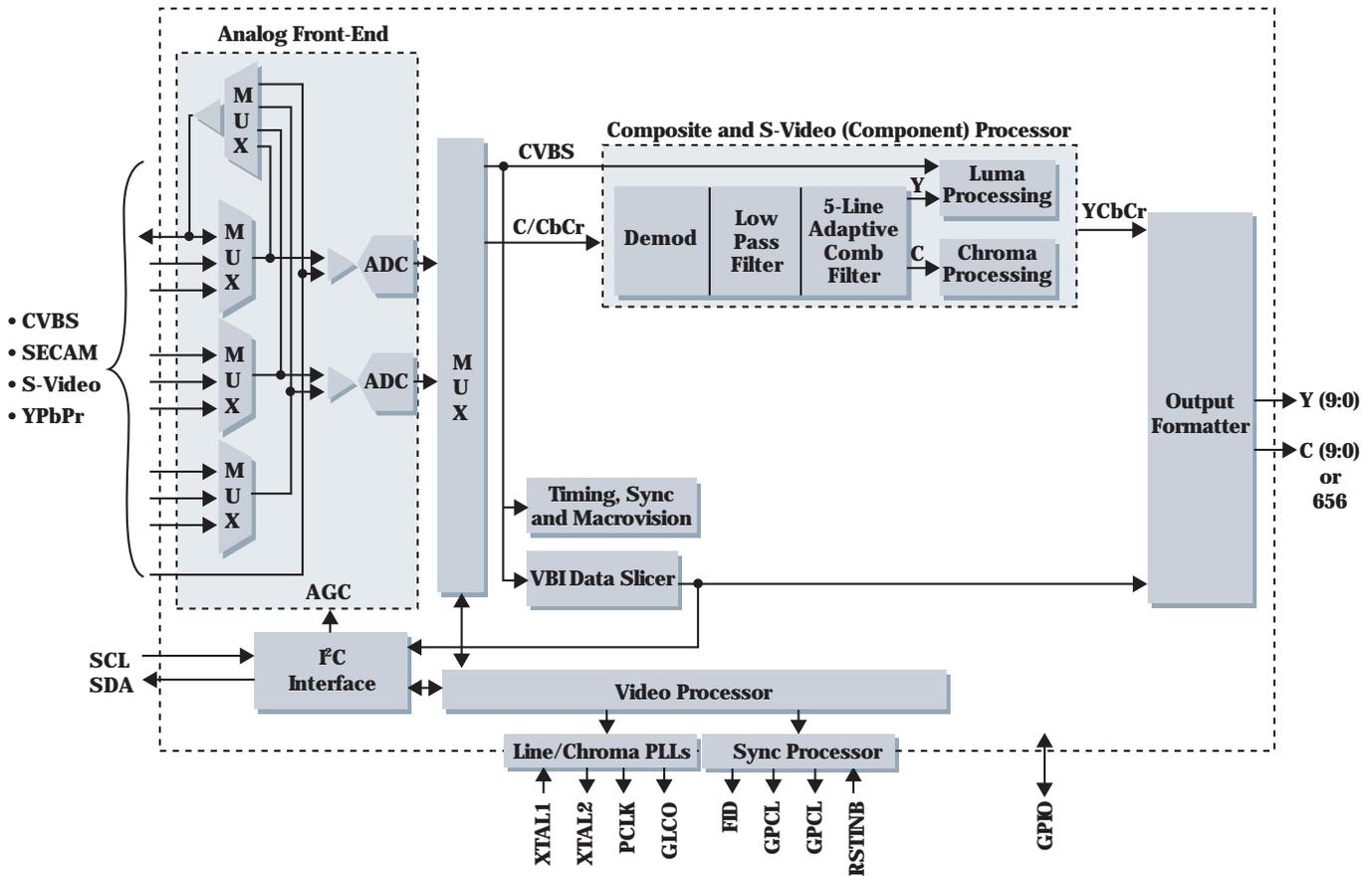
data in the digital outputs.

A low-power device, the TVP5147 features a 1.8-V digital core, 3.3-V for digital I/O. Power-saving standby modes are controlled via I²C.

The TVP5147 is available in an 80-pin TQFP PowerPAD™ package and also supports the Macrovision™ copy detection standards including: type 1, 2, 3 and separate color stripe detection.

For More Information
For more information about using the TVP5147 in a consumer electronic application, contact your local TI field sales office.

TEXAS INSTRUMENTS

SLYT057