



Digital Video Decoder from Texas Instruments Creates the Crisp Images and Enhanced Features that TV and DVD-R Manufacturers Need to Stand Apart

Next-Generation Video Decoder Runs 3D Comb Filtering for both NTSC and PAL

Today, video technology is one of the primary driving forces of the consumer electronics industry. According to iSuppli, medium-size and high-end television shipments will soar from 29 million units shipped in 2004 to 82 million units in 2008. Texas Instruments has developed a market leading product to improve video image quality whether from a DVD player, terrestrial broadcast, satellite/cable or VCR. Video decoders translate National Television Standards Committee (NTSC), Phase Alternation Line (PAL) and Systeme Electronique Couleur Avec Memoire (SECAM) analog video signals from these sources into digital video for display on your TV or for storage on DVD discs or hard disk drives. What's different about TI's new TVP5160 video decoder is that it offers market leading capabilities in a single, cost effective chip bringing to consumers features often only found in high-end video systems or professional products. (See <http://www.ti.com/tvp5160>.)

Most video decoders today offer two-dimensional (2D) comb filter video decoding, only processing several "lines" of video information at a time. 2D comb filters can produce adequate image quality for many of today's consumer applications. TI's new TVP5160 includes both 2D and three-dimensional (3D) adaptive comb filters, processing video over multiple video "frames" producing sharper images. In addition, the new video decoder supports intermediate frequency (IF) compensation which can further improve images by correcting color distortions along image edges caused by TV tuners. In supporting time base correction, the TVP5160 improves VCR video performance by reducing image misalignment ("jitter"). 3D noise reduction reduces random or intermittent unwanted video artifacts or "noise" associated with weak broadcast signals as well as dirty or weak VCR tapes. In addition, the TVP5160 supports higher-quality video standards such as 480p (progressive) and 576p enabling TVs to display progressive video found on most DVD discs and output by many DVD players.

TVP5160 Mixed Signal Video Decoder Features

3D COMB FILTER: 2D and 3D comb filters are typically used to separate black/white ("Y") and color ("C") information from single line composite signals. 2D comb filters only process three to five lines of static video data, while 3D comb filters use multiple frame buffers to process video over the time domain. In its 3D comb filter, the TVP5160 examines the video

image on a per-pixel basis to determine whether to apply its improved 2D, five-line adaptive comb filter for moving images (such as a football moving through the air) or its three-frame 3D comb filter for static background images (for the field and stadium). The chip applies a flexible motion-detection algorithm to best meet the preferences of target manufacturers and their display technology. Application of TI's 3D comb filter and sophisticated 3D Y/C separation algorithms result in clearer, crisper images when video signals are processed through the composite connector. This is accomplished by reducing cross color and dot crawl visual artifacts.

3D NOISE REDUCTION: "Noise" is commonly described as unwanted random or intermittent image artifacts often introduced into the video stream by weak terrestrial broadcast signals and magnetically weak or dirty VCR tapes. 3D noise reduction reduces these artifacts by averaging pixels from frame-to-frame to reduce the effects of such noisy conditions.

TIME BASE CORRECTION: The TVP5160 also provides time base correction which is a vital feature when transferring VCR home movies to DVD discs using a DVD Recorder. VCR's have inherent mechanical design deficiencies that cause image shifting. In addition, weak magnetic signals on older VCR tapes, worn mechanical parts and tape stretch contribute to bent or distorted video images that jump or waiver. Time base correction automatically realigns the image to correct for many of these factors. Now, with the TVP5160, consumers will gain access to many of the features only found in professional systems, producing a more steady and aligned image.

IF COMPENSATION: Yet another feature that helps differentiate products based on this device is IF compensation. This feature addresses the tendency of some TV tuners to suffer from video artifact distortion especially noticeable along the edges between flesh tones and backgrounds. With the TVP5160, this imaging artifact is greatly reduced.

CONCURRENT OPERATION: With many competing video decoders, numerous features are not capable of operating at the same time due to limitations in their chip architectures. In some products for example, when the 3D comb filter is enabled to improve NTSC terrestrial broadcast video, the noise reduction feature must be disabled. It's like buying a car where your audio system only works when the engine is turned off. These types of restrictions inhibit the overall image improvement capabilities of the product. TI's TVP5160 allows for concurrent operation of its 3D comb filter, 3D noise reduction, time base correction and IF compensation features providing for an improved overall video image.

INPUT FLEXIBILITY: In competing products, features such as noise reduction or time base correction processing are often locked to specific input connectors. For example, noise reduction processing can't be applied to VCR or DVD video streams entering the TV or DVD recorder through the S-video, component or Syndicat francais des Constructeurs d'Appareils Radio et Television (SCART) input connectors. The TVP5160 noise reduction and time base correction features accept and process video from all input connections including composite, S-video, SCART and component interfaces.

Mixed Signal Video Decoder Product Family

The TVP5160 joins an existing family of mixed signal video decoders. Previously announced, the TVP5146 is optimized for high-end TVs and DVD recorders, and European consumer products where fast switching SCART capabilities are required. The TVP5147 reduces manufacturer's cost while maintaining video quality targeting PAL TV and DVD recorder applications in China and NTSC for North America/Japan. The TVP5150 is the world's smallest, lowest power and lowest cost NTSC/PAL/SECAM video decoder, consuming only 115 mW, and can be found in analog mobile phone TV applications, portable DVD players, portable multimedia players, battery-powered USB PC video capture devices, surveillance camera systems and many other low-cost or portable video systems applications.

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About Texas Instruments

Texas Instruments Incorporated provides innovative DSP and analog technologies to meet our customers' real world signal processing requirements. In addition to Semiconductor, the company's businesses include Sensors & Controls, and Educational & Productivity Solutions.

TI is headquartered in Dallas, Texas, and has manufacturing, design or sales operations in more than 25 countries.

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