NTSC/PAL Single Chip Video Decoder & Encoder with Frame Capture & Hold

Introduction

Techwell's TW58 is a high quality NTSC, and PAL video decoder with analog video inputs and a video encoder with analog outputs for multimedia applications. In addition a dedicated digital video output port and a full 16-bit CPU interface is included. External SDRAM allows the capture and manipulation of video frames.

Minimum external components are required due to an integrated analog front-end containing AGC, clamping, and two ADCs. The integrated video encoder includes DACs for analog video output. For composite inputs Y/C processing based on proprietary technologies produce exceptionally high quality pictures. A high quality internal scaling engine offers arbitrarily filtered down scaling of the output picture.

Analog Video Decoder

– NTSC (M), NTSC (4.43) and PAL (B, D, G, H, I,)
– Advanced synchronization processing for VCR fast forward, backward, and pause mode
– Software selectable analog inputs allows any of the following combinations:
  • Up to 4 composite video inputs
  • 3 composite , 1 S-Video or 1 component inputs
  • 2 composite inputs, 2 S-Video inputs
  • 2 composite , 1 S-Video and 1 analog YPbPr component inputs
– Internal automatic gain control with white peak detection
– Three 8-bit ADCs with automatic clamping

Video processing

– Proprietary 2-H, 3-line adaptive comb filter Y/C separation
– Adaptive color demodulation with high color bandwidth
– Proprietary nonlinear image enhancement and noise suppression
– Programmable hue, brightness, saturation, contrast, sharpness control, and noise suppression
– Automatic color control and color killer
– High quality horizontal and vertical filtered scaling with arbitrary scale down ratio
– Programmable output cropping
– Video Output
– 2 channel 9-bit DAC, Composite and S-Video analog output

– VMI 1.4 compatible 8-bit or 16-bit digital video output, ITU-R 601 or ITU-R 656 compatible output YCbCr 422 output format
– Closed caption decoding
– VBI data pass through, raw ADC data output for Intercast™

Video Frame Capture & Manipulation

– Capture and Output Video Frame, Output OSD Image or Overlay Image
– 16-bit wide DRAM Interface for 16Mb or 64Mb SDRAM
– Overlay function with same resolution as full video Image
– 256 color/16,770,000 color Pallet
– 16-bit CPU Interface (80xx CPU Interface) with arbitration

OSD Function

– OSD Resolution ½ H, ½ V of full video image
– 16 colors to 65,536 color pallet
– Up/Down and Left/Right Mirror function, Sepia color process, Blue back display, Grid Display, Tone down display

Miscellaneous

– Typical power consumption 0.5W
– Single 27MHz crystal for all standards
– 3.3 V power supply, 5V tolerant