

## TW8830

### LCD Controller

FN8280  
Rev. 0.00  
April 13, 2012

## Description

The TW8830 incorporates many of the features required to create multi-purpose a Video Door phone intercom LCD display system in a single package. It integrates a high quality 2D comb NTSC/PAL/SECAM video decoder, triple high speed RGB ADCs, high quality scaler, and images enhancement functions which include Black and White Stretch and Gamma Correction. It also supports panoramic scaling for conversion to wide screen display. The TW8830 supports a rich combination of inputs: CVBS, S-video, analog RGB as well as digital BT.656. On the output side, it supports a wide variety of digital panel types with its built-in timing controller.

## Features

### ANALOG VIDEO DECODER

- NTSC (M, 4.43) and PAL (B, D, G, H, I, M, N, N combination), PAL (60), SECAM with automatic format detection
- Three 10-bit ADCs and analog clamping circuit
- Fully programmable static gain or automatic gain control for the Y or CVBS channel
- Programmable white peak control for the Y or CVBS channel
- Software selectable analog inputs
- High quality adaptive 2D comb filter for both NTSC and PAL inputs
- PAL delay line for color phase error correction
- Image enhancement with 2D dynamic peaking and CTI
- Digital sub-carrier PLL for accurate color decoding
- Digital horizontal PLL and Advanced synchronization processing for VCR playback and weak signal performance
- Programmable hue, brightness, saturation, contrast and sharpness
- High quality horizontal and vertical filtered down scaling with arbitrary scale-down ratio

### ANALOG RGB INPUTS

- Triple high speed 10-bit ADCs with clamping and programmable gain amplifier.

- SOG and H/V sync support for YPbPr or RGB input
- Built-in line locked PLL with sync separator
- Supports analog input resolution up to 1080i or WXGA

### DIGITAL INPUTS SUPPORT

- Supports BT.656 video formats

### TFT PANEL SUPPORT

- Built-in programmable timing controller
- Supports 3, 4, 6 or 8 bits per pixel up to 16.8 million colors with built-in dithering engine
- Supports digital panel up to WVGA/SVGA resolution
- Supports Serial (8-bit) RGB panel

### ON SCREEN DISPLAY

- 6912 byte programmable font RAM and 256 display RAM
- Four windows font OSD with bordering / shadowing
- 1/2/3/4 bits/pixel
- Supports variable width (12/16), height (2~32)

### IMAGE PROCESSING

- High quality scaler with both up/down and nonlinear scaling support
- Panorama / Water-glass scaling
- Built-in 2D de-interlacing function
- Programmable hue, brightness, saturation, contrast and sharpness
- Programmable cropping of input video and graphics
- Independent RGB gain and offset controls
- Panorama / Water-glass scaling
- Programmable 8-bit Gamma correction for each color
- Operated in Frame Sync mode
- Black/White Stretch

### CLOCK GENERATION

- Spread spectrum clock
- Modulation frequency and spread width are selectable

**TIMING CONTROLLER (TCON)**

- Supports programmable timing interface signals for control
- Column (source) driver / row (gate) driver

**MCU**

- Industry standard 8052 based
- Code fetch from external SPI flash memory
- 512B XDATA memory

**POWER MANAGEMENT**

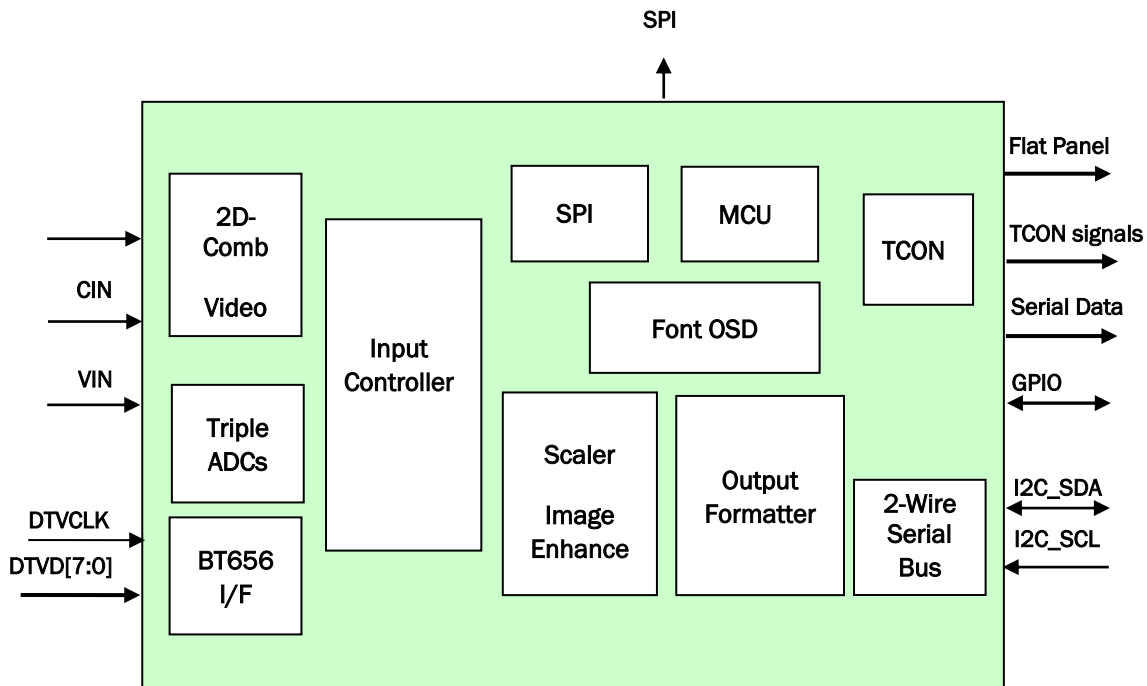
- Supports functional based independent
- power down
- 1.8 / 3.3 V operation

**MISCELLANEOUS**

- Supports 2-wire serial bus interface
- Built-in 2 channel Auxiliary ADC input
- Single 27MHz crystal
- 80-pin LQFP package

**Applications**

- Video door phone intercom display controller
- Portable DVD and DVRs players
- Portable media player



TW8830 FUNCTIONAL BLOCK DIAGRAM

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