TW8820

LCD Controller

Description

The TW8820 incorporates many of the features required to create a multi-purpose Video Door phone intercom LCD display system in a single package. It integrates a high quality 2D comb NTSC/PAL/SECAM video decoder, high quality scaler, and image enhancement functions which include Black and White Stretch and Gamma Correction. It also supports panoramic scaling for conversion to wide screen display. TW8820 supports analog composite video input and the output supports a wide variety of digital LCD 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
- 10-bit ADC 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
- 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

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 panels up to WVGA/SVGA resolution
- Supports Serial (8-bit) RGB panels

TIMING CONTROLLER (TCON)

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

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
- Programmable 8-bit Gamma correction for each color
- Operates in Frame Sync mode
- Black/White Stretch

CLOCK GENERATION

- Spread spectrum clock
- Selectable Modulation frequency and spread width

MCU

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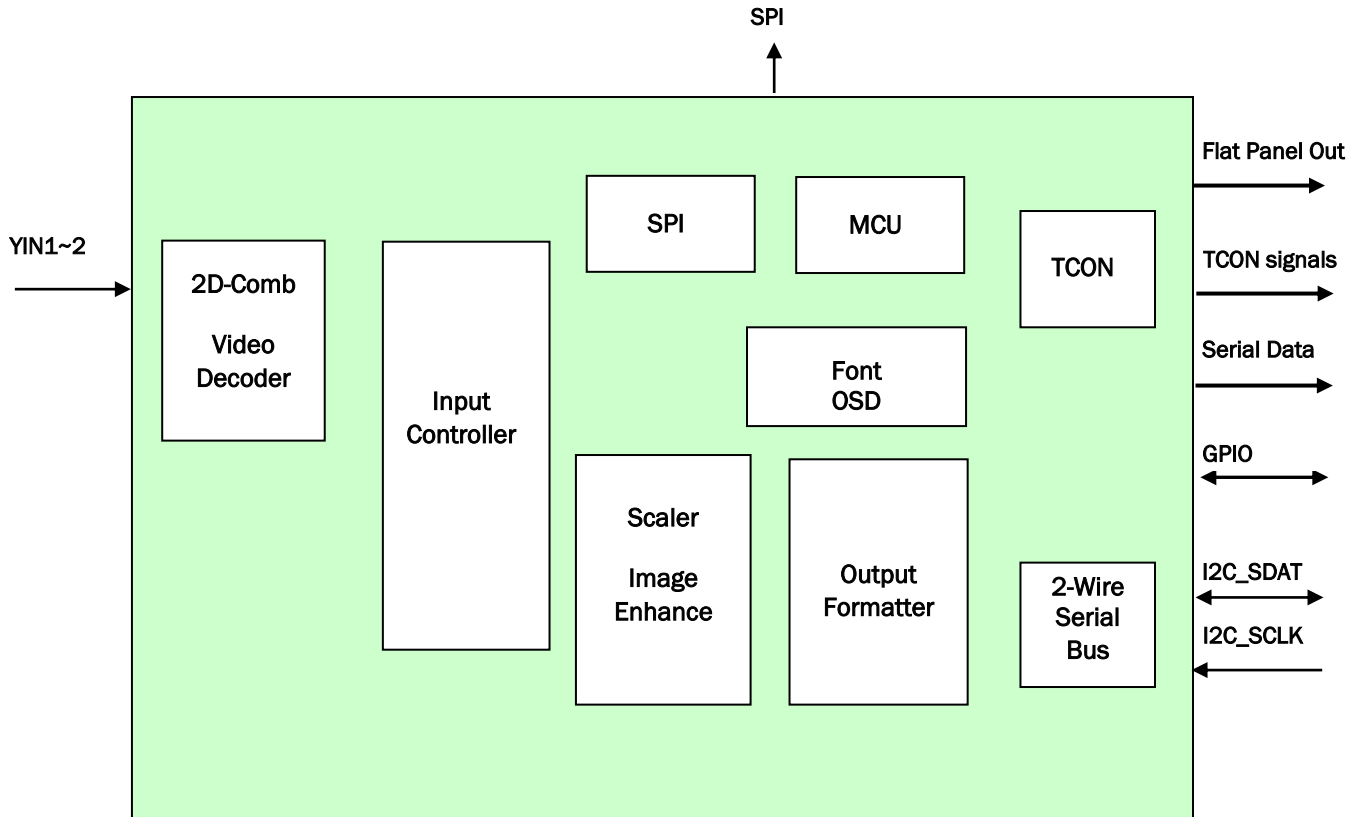- 512 byte XDATA memory

POWER MANAGEMENT

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

MISCELLANEOUS

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

Applications

- Video door phone intercom display controller
- Portable DVD players, media players, and DVRs
- Rear Camera Displays

SPI

YIN1~2

2D-Comb

Video
Decoder

Input
Controller

SPI

MCU

Font
OSD

Scaler

Image
Enhance

Output
Formatter

TCON

2-Wire
Serial
Bus

Flat Panel Out

TCON signals

Serial Data

GPIO

I2C_SDAT

I2C_SCLK

TW8820 FUNCTIONAL BLOCK DIAGRAM

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