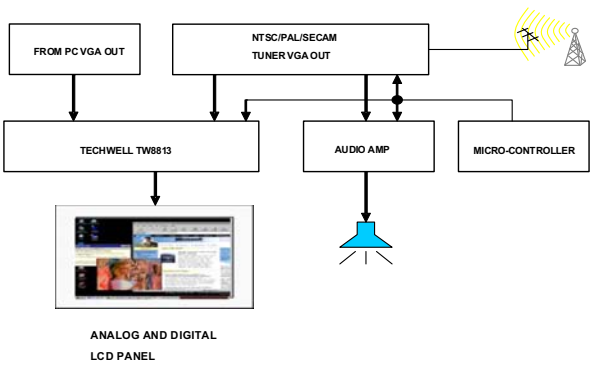
TW8813B

TFT Flat Panel Controller with built-in LVDS, 3D Video Decoder, Triple ADCs and Dual PIP Support

FN7761
Rev.0.00
December 06, 2010



Applications

- LCD TVs for home and mobile use
- Computer LCD Panel Monitors with Television
- Portable DVD and DVRs players
- Progressive Scan TV, DTV and HDTV monitors
- Portable media player

Features

The TW8813 incorporates many of the features required to create multi-purpose in-car LCD display system in a single package. It integrates a high quality 3D comb NTSC/PAL/SECAM video decoder, triple high speed RGB ADCs, dual scalers for PIP and dual-PIP support, LVDS, bit-mapped OSD, TCON, triple DACs and images enhancement functions which include Black and White Stretch, favorite color enhancement and edge enhancement. To further facilitate the move to wide screen displays, it also supports panoramic scaling. On the input side, it supports a rich combination of CVBS, S-video, YPbPr, analog RGB as well as digital YCbCr/RGB inputs. On the output side, it supports both digital and analog panel type with its LVDS and analog RGB output.

TW8813 also has a PIP (Picture in Picture) function that can display two sources display simultaneously on single display window. It also has built-in bit-mapped OSD with acceleration as well as 16-bit external OSD support.

Analog Video Decoder

NTSC (M, 4.34) 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 allows any of the following combinations:
  - "Up to 4 composite video
  - "Up to 2 S-Video
  - "Up to 1 YPbPr
- . High quality motion adaptive 3D comb filter for both NTSC and PAL with concurrent 3D noise reduction
- 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, sharpness.
- High quality horizontal and vertical filtered down scaling with arbitrary scale down ratio
- Detection of level of copy protection according to Macrovision standard
- Supports YPbPr input up to 1080i with sub-sampled resolution
- Support Automatic Standard Detection for YPbPr Input

Analog RGB Inputs

- Triple high speed 10-bit ADCs with clamping and programmable gain amplifier.
- Up to three independent RGB / YPbPr channels with corresponding SOG
- Built-in line locked PLL with sync separator
- Allows high resolution components inputs like DTV 480p, 720p, 1080i
- 24bit Digital RGB and 8/16/24-bit YCbCr Inputs
- Allows connection with alternative Video and PC Graphics inputs.
- Support both 656 and 601 video formats
- Allows connection to external HDMI receiver
- Support additional digital 18-bit input when main digital input is 18-bit mode

TFT Panel Support

- Supports single channel LVDS panel with resolution up to WXGA, 80Mhz
- Supports 3, 4, 6 or 8 bits per pixel up to 16.8 million colors with built-in dithering engine
- Support analog panel with resolution up to WQVGA, 20Mhz
- Built-in programmable timing controller

On Screen Display

- Supports dual window bitmapped OSD.
- Built-in OSD controller with Bit built Engine
- Supports variety functions included like blinking, transparency and blending.
- Supports External 16-bit OSD with external alpha blending control.
- Support OSD compression

Image Processing

- Built-in 2D de-interlacing engine with proprietary low angle compensation circuit for smooth video rendering.
- Built-in high quality scaler with nonlinear scaling support
- Programmable hue, brightness, saturation, contrast
- Sharpness control with vertical peaking up to +12db
- Programmable color transient improvement control
- Supports programmable cropping of input video and graphics.
- Independent RGB gain and offset controls
- Panorama / Water-glass scaling
- DTV hue adjustment
- Programmable 10-bit Gamma correction for each color
- Operated in Frame Sync mode only
- Black/White Stretch
- Programmable favorite color enhancement

PIP Function

- Dual PIP with variable sub window size
- POP
- Built-in high quality down scaling engine for PIP

SDRAM

- Support 16bits Bus width SDRAM
- Host Interface
- Supports 2-wire serial bus interface
- Supports 8Bits Parallel Host Interface
- Support DMA transfer

Clock Generation

- Frequency synthesizer with spread spectrum generate memory and display clocks
- Spread spectrum profile based on triangular modulation with center spread
- Modulation frequency and spread width can be selectable
- Power Management
- Supports Panel power sequencing.
- Supports DPMS for monitor power management.
- 1.8 / 3.3 V operation

Miscellaneous

- Built-in single CCFL back light controller
- Built-in single LED back light controller
- Power-down mode
- Single 27MHz crystal
- 208-pin LQFP package