



**TECHWELL  
DISPLAY**



## Automotive Display ICs

# TW8813

3D Video Decoder based LCD controller  
with built-in LVDS panel interface

TW8813 is a highly integrated and flexible LCD controller for the automotive infotainment market, including front console and rear seat entertainment applications. TW8813 integrates an 8-bit LVDS panel interface to support digital panels up to 720p resolution. TW8813 also embeds a built-in high quality 3D video decoder, 2D Scaler/De-interlacer, TCON, panel back-light controllers and bit-map OSD engine in a single package. TW8813 supports a variety of analog inputs and adds flexibility by supporting two Digital RGB input ports.

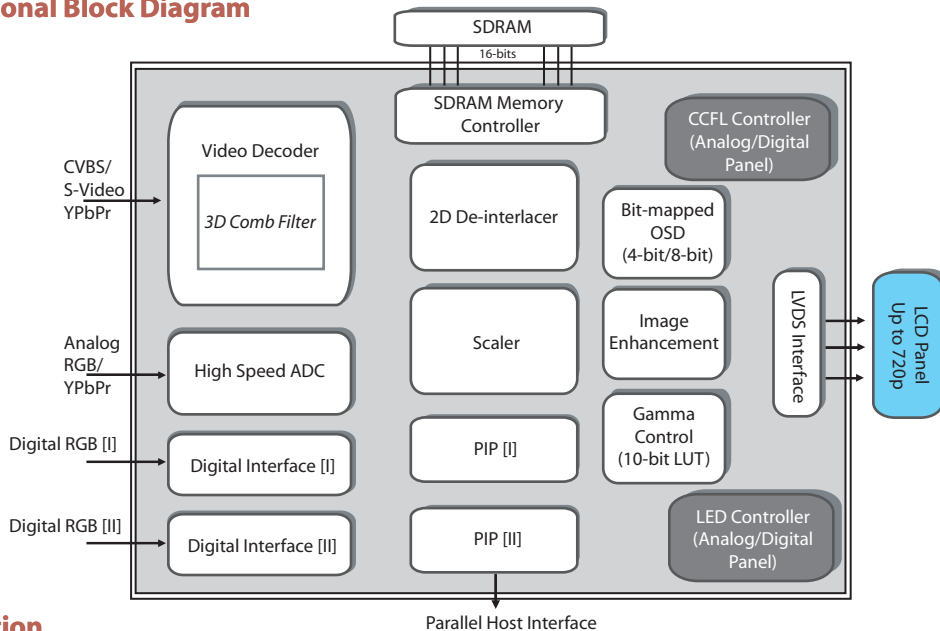
### Target Applications

- Navigation + DVD + TV
- Back up Camera
- Rear Seat Entertainment
- Car TV
- Portable DVD player
- Portable TV
- In Flight Entertainment

### Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr. Supports single 24-bits Digital RGB input or Dual 18-bits Digital RGB inputs. Both interlaced & progressive ITU 656 and 601 formats supported
- LVDS panel interface can support digital panels with resolutions up to 720p
- Integrated 16-bits SDRAM memory controller supporting external SDRAM up to 8MB
- Built-in 2 PIP engines
- Built-in dual window bit-mapped (4/8-bits) OSD
- External 18-bits OSD supported with alpha blending control
- Embedded Image Enhancement:
  - Programmable CTI, hue, brightness, saturation, contrast and sharpness control
  - Black/White Stretch
  - Programmable favorite color enhancement- up to three colors (Skin, Grass and Sky)
  - Programmable Gamma Correction tables

### TW8813 Functional Block Diagram



### Order Information

Part #	Name	Description	Pin Count	Body Size
TW8813	LQFP 208	Low Profile Quad Flat Package	208	28 x 28 mm <sup>^2</sup>

### 3D 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 8-bit ADCs with clamping and programmable gain amplifier.
- Up to two independent RGB / YPbPr channels with corresponding SOG
- Built-in line locked PLL with sync separator
- Allows high resolution components inputs like DTV 480i, 480p, 576i, 576p, 720p & 1080i
- Supports PC inputs up to SXGA

### 8/16/18/24-bits Digital Inputs

- Supports single 24-bits Digital RGB input port or Dual 18-bits Digital RGB input ports
- Allows connection with Video & PC graphics inputs
- Supports both 656 & 601 video formats
- Allows connection to HDMI receiver

### SDRAM (up to 8MB)

- Support 16-bit bus width SDRAM

### 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

### About Techwell

Techwell is a fabless semiconductor company that designs, markets and sells mixed signal integrated circuits for multiple digital video applications in the consumer, security surveillance and automotive markets, including advanced TVs, multifunction LCD monitors, DVD Recorders, security surveillance systems and in-car LCD displays. Founded in 1997, we currently have over 160 employees and are headquartered in San Jose, California, with additional R&D and sales activities in South Korea, Japan, Taiwan and China. NASDAQ:TWLL

# TW8813

3D Video Decoder based LCD controller  
with built-in LVDS interface

### Bit-map OSD

- Dual window 4-bit/8-bit bitmapped OSD
- Built-in OSD controller with BitBlit Engine
- Supports variety functions included like blinking, transparency and blending
- Supports External 18-bit OSD with external alpha blending control
- Support OSD compression

### PIP Engine

- Built-in 2 PIP engines with variable sub window size
- PIP overlay supported over main
- Support PIP alpha blending
- Built-in high quality down scaling engine

### Image Processing & Enhancement

- Built-in 2D de-interlacing engine
- Built-in high quality scaler with nonlinear scaling support- Panorama & Water-glass
- Programmable hue, brightness, saturation, contrast
- Sharpness control with vertical peaking
- Programmable color transient improvement control
- Supports programmable cropping of input video and graphics
- Independent RGB gain and offset controls
- DTV hue adjustment
- Programmable Gamma correction for each color
- Operated in Frame Sync mode only
- Black/White Stretch
- Programmable favorite color enhancement

### Host Interface

- Supports 2-wire serial bus interface
- Supports 8Bits Parallel Host Interface

### LVDS Panel Interface

- Supports 6 or 8 bits per pixel up to 16.8 million colors with built-in dithering engine
- Supports digital panels with resolutions up to 720p
- Power down mode
- Drives long, low cost cables

### Power Management

- Supports Panel power sequencing
- Supports DPMS for monitor power management
- 1.8 / 3.3 V operation

### Miscellaneous

- Power-down mode
- Temperature rating: -40 C to +85 C
- Single 27MHz crystal
- 208-pin LQFP package

For more information on Techwell, please contact us at 1-408-435-3888  
All other trademarks are property of their respective owners ©2009 Techwell Inc. All rights reserved.