



TECHWELL
DISPLAY



Automotive Display ICs

TW8811

3D decoder based on LCD controller with PIP, Graphic OSD & CCFL/LED controller

The TW8811 is a highly integrated multi-purpose LCD TFT flat panel controller with NTSC/PAL/SECAM 3D video decoder and a 2D De-interlacer/Scaler targeting Automotive Infotainment and Consumer applications. Through multiple input ports, TW8011 can directly display video and graphic content from a variety of devices including TV Tuners, DVD players, back-up cameras, DTV/DMB receivers and navigation/GPS receivers.

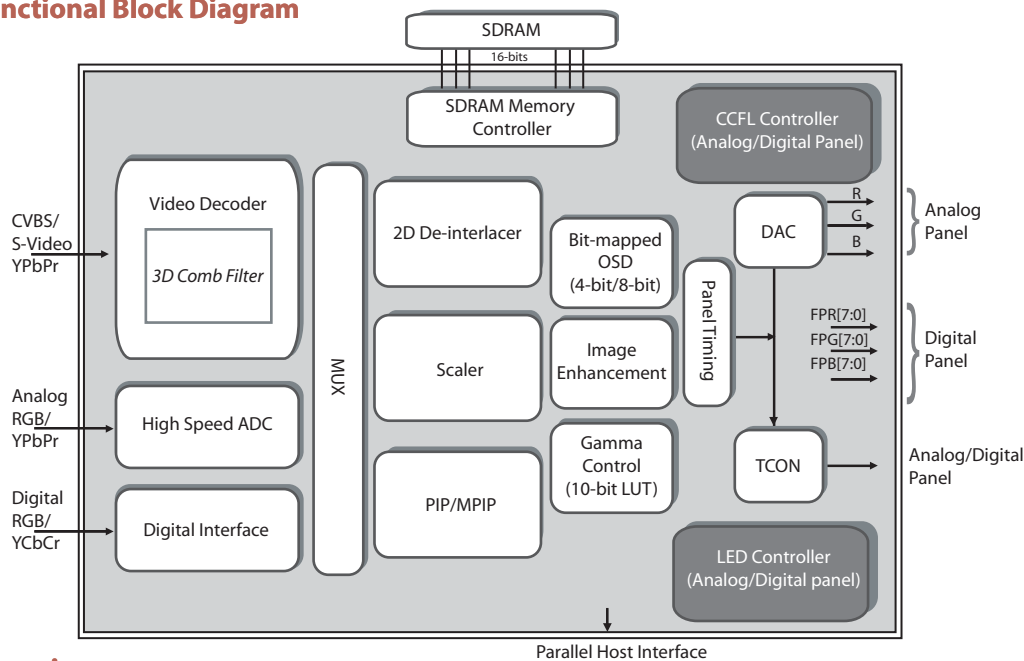
Target Applications

- Navigation + DVD + TV
- Back up Camera
- Rear Seat Entertainment
- Car TV
- Portable DVD
- PMP
- Portable TV
- Door Phone
- Photo Frame
- DMB TV
- Baby Monitor
- Home Audio
- In Flight Entertainment

Key Features

- Supports analog inputs including CVBS, S-Video, YPbPr & RGB signals and digital inputs including 8/16/24 bit RGB/YCbCr. Interlaced and progressive ITU 656 inputs are supported.
- Supports both digital and analog panels up to WXGA resolutions
- Integrated CCFL controller & LED controller to reduce BOM cost
- Integrated low cost 16-bit SDRAM memory controller supporting up to 8MB external SDRAM memory
- Built-in single window bit-mapped (4/8 bits) OSD
- Supports external 18-bit OSD with alpha blending control
- PIP Overlay
- Embedded Image Enhancement
 - Programmable CTI, hue, brightness, saturation, contrast & sharpness control
 - Black/White Stretch
 - Programmable favorite color enhancement- up to three colors (Skin, Grass & Sky)
 - Programmable Gamma Correction tables

TW8811 Functional Block Diagram



Order Information

Part #	Name	Description	Pin Count	Body Size
TW8811	PQFP 208	Plastic Quad Flat Package	208	28 x 28 mm ^{^2}

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/YPbPr Inputs

- Triple high speed 8-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 480i, 480p, 576i, 576p, 720p & 1080i
- Supports PC inputs up to SXGA

8/16/24-bits Digital RGB/YCbCr Inputs

- Allows connection with alternative Video and PC Graphics inputs
- Support both 656 and 601 video formats
- Allows connection to HDMI receiver

TFT Panel Support

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

SDRAM (up to 8MB)

- Support 16-bit bus width SDRAM

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Bitmapped 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 Function

- PIP with variable sub window size
- Support PIP alpha blending
- POP and Multiple PIP support
- Built-in high quality down scaling

LED Controller

- Boost-up
- DC and PWM Dimming Control
- Built-in Open LED Protection
- 1MHz fixed Switching Frequency
- Resistor-programmable LED Current

CCFL Controller

- Single channel CCFL controller based on push-pull architecture
- Lamp fault monitoring- Lamp Open, Lamp Over-current, Failure to Strike and Over-voltage
- Programmable Lamp Frequency to move EMI spurs out of band
- Analog or digital brightness control. 300:1 dimming range

Image Processing & Enhancement

- 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
- 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 Gamma correction for each color
- Operated in Frame Sync mode only
- Black/White Stretch
- Programmable favorite color enhancement

Power Management

- Supports Panel power sequencing
- Supports DPMS for monitor power management
- 1.8 / 3.3 V operation
- Temperature ratings: -40 C to +85 C