



**TECHWELL  
DISPLAY**



## Automotive Display ICs

# TW8817

Low cost, highly integrated LCD controller for digital LCD panels

The TW8817 is a highly integrated low cost TFT flat panel controller supporting digital panels. To reduce BOM cost, TW8817 integrates a SECAM/NTSC/PAL video decoder supporting CVBS & S-Video inputs, an 8-bit MCU, a CCFL controller and a LED controller. The TW8817 integrates a high quality NTSC/PAL/SECAM 2D video decoder and a 2D De-interlacer/Scaler.

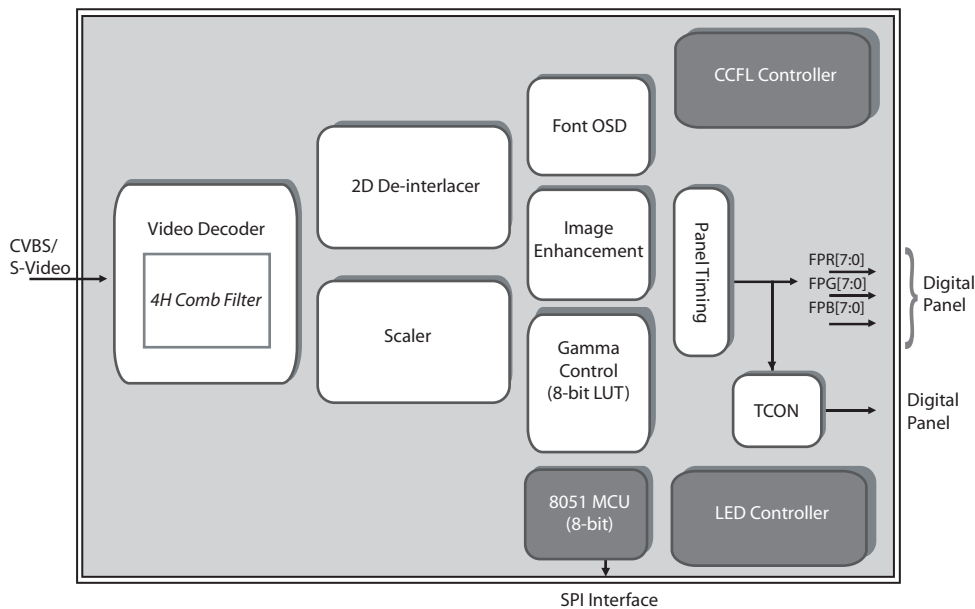
### Target Applications

- 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 signals
- Supports digital panel up to SVGA resolution
- Integrated 8-bit 8051 MCU, CCFL and LED controller
- Built-in 8 color font based OSD with ~200 ROM & 75 RAM fonts. Supports Multi-color fonts by combining 3 single color fonts
- 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 table

### TW8817 Functional Block Diagram



### Order Information

Part #	Name	Description	Pin Count	Body Size
TW8817	TQFP 80	Thin Quad Flat Package	80	12 x 12 mm <sup>^2</sup>

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## 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
- Advanced synchronization processing for VCR trick play signal
- Two 10-bit ADCs and analog clamping circuit
- Built-in analog anti-aliasing filter
- 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:
  - 2 composite video
  - 1 S-Video
- 4-H adaptive comb filter Y/C separation
- PAL delay line for color phase error correction
- Digital PLL for both color and horizontal locking
- Programmable hue, brightness, saturation, contrast, sharpness, Gamma control, and noise suppression
- Automatic color control and color killer
- Detection of level of copy protection according to Macrovision standard

## TFT Panel Support

- Supports a wide variety of Digital single pixel active matrix TFT panels
- Supports digital TTL panel up to SVGA
- Supports 3, 4, and 6 bits per pixel format

## Font OSD

- Built-in Font OSD with 202 ROM and programmable 227 RAM fonts. Supports Multi-color fonts by combining 3 single color fonts
- Multi-window OSD support with color pallet
- Support OSD overlay with alpha blending

## Built-in Microcontroller

- Support external SPI Interface
- Support I2C Master interface with GPIO
- Support 2 LED signal interface with GPIO
- Support UART interface with GPIO
- Support IR or interrupt with GPIO

## 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 vdimming range with the digital brightness control
- Low power stand-by mode

## Image Processing & Enhancement

- Built-in 2D de-interlacing engine
- Built-in high quality scalar
- Programmable hue, brightness, saturation, contrast
- Sharpness control with vertical peaking
- Programmable color transient improvement control
- Panorama / Water-glass scaling
- Programmable Gamma correction tables
- 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

## Timing Controller (TCON)

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

## Miscellaneous

- Supports 2-wire serial bus interface
- Temperature rating: -40 C to +85 C
- Spread spectrum PLL
- Low-speed ADC for KEY scan
- Programmable panel VCOM offset control
- 5V tolerant I/O
- Power-down mode
- Single 27MHz crystal

## 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 125 employees and are headquartered in San Jose, California, with additional R&D and sales activities in South Korea, Japan, Taiwan and China. NASDAQ: TWLL

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