intersil ™ **Techwell**

Automotive Display ICs

TW8827

Ultra low cost, highly integrated
LCD controller for analog LCD panels

The TW8827 is an ultra low cost, highly integrated LCD TFT flat panel controller supporting analog panels. To reduce BOM cost, TW8827 integrates a NTSC/PAL/SECAM video decoder supporting CBVS & S-Video inputs, an 8-bit MCU, a CCFL controller and a LED controller. The TW8827 integrates a high quality NTSC/PAL/SECAM 2D video decoder and a 2D De-interlacer/Scaler. In addition, 16-bit digital RGB/YCbCr inputs are supported through built-in digital interface.
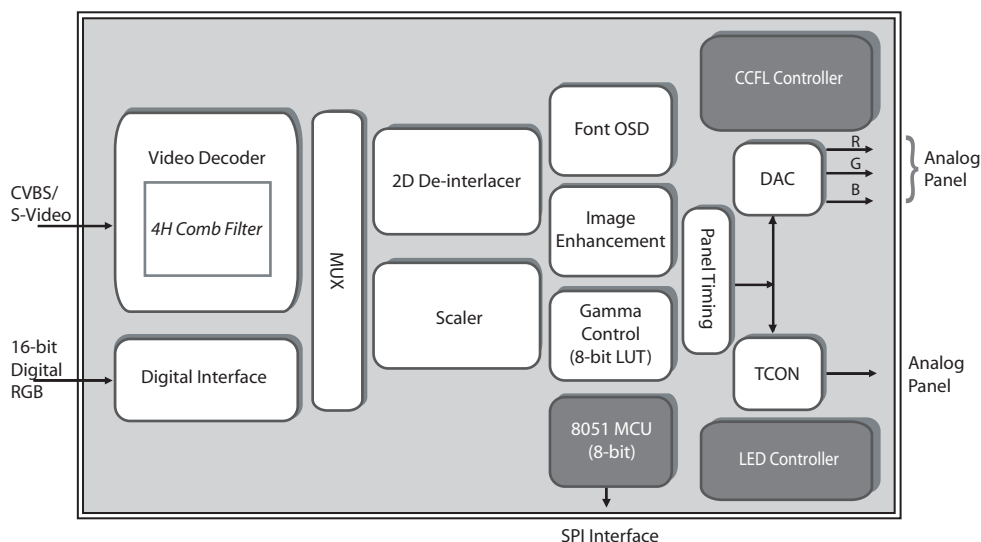
Target Applications

- 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 and digital inputs including 18-bitss RGB/YCbCr. Both interlaced and progressive ITU-656 and ITU-601 formats are supported
- Supports analog panel up to WQVGA resolutions
- Integrated 8-bit 8051 MCU, LED controller and CCFL controller
  Built-in 8 color font based OSD with ~200 ROM & 75 RAM 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

TW8827 Functional Block Diagram

Order Information

Part #	Name	Description	Pin Count	Body Size
TW8827	TQFP 80	Thin Quad Flat Package	80	12 x 12 mm

TW8827
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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

16bits Digital RGB/YCbCr Inputs

- Supports 18-bits RGB/YCbCr digital input
- Supports both interlaced and progressive ITU 656 source

TFT Panel Support

- Supports a wide variety of Analog active matrix TFT panels
- Supports analog panel up to WQVGA (480 x 234)

Font OSD

- Built-in OSD controller with integrated character ROM and programmable RAM font- 202 ROM & 75 RAM 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 dimming 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
- Independent RGB gain and offset controls
- Panorama / Water-glass scaling
- YCbCr hue adjustment
- Programmable Gamma correction tables
- Built-in YCbCr to RGB color space converter
- 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
- Typical power consumption less than TBD
- 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

For more information on Techwell, please contact us at 1-408-435-3888

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