

# INTERSIL TECHWELL AUTOMOTIVE DISPLAY ICs

Product Line Comparison , Advanced LCD Display  
Controllers, Low Cost LCD Display Controllers

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#### **About Intersil Techwell, Inc.**

Techwell, now part of Intersil, designs, markets and sells mixed signal integrated circuits for multiple video applications in the security surveillance and automotive infotainment markets. Intersil Techwell designs application specific products that enable the conversion of analog video signals to digital form and perform advanced digital video processing to facilitate the display, storage and transport of video content.

## Intersil Techwell Worldwide Technical Support

### **Corporate Headquarters**

Intersil Corporation Headquarters  
1001 Murphy Ranch Road  
Milpitas, CA 95035  
TEL: (408) 432-8888  
FAX: (408) 434-5351  
1-888-INTERSIL  
1-888-468-3774

### **China Sales**

Tel: 86-755-8294-5668  
Fax: 86-755-8294-5607

### **Japan Sales**

Tel: +81-3-5488-TWLL (8955)  
Fax: +81-3-5488-8957

### **Korea Sales**

Tel: 82-31-713-8480  
Fax: 82-31-713-8481

### **Taiwan Sales**

Tel: 886-2-8751-0280  
Fax: 866-2-8751-0206

### **North and South America Sales**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

### **EMEA Sales**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

### **India and Southeast Asia Sales**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

### **For all other regions, please contact:**

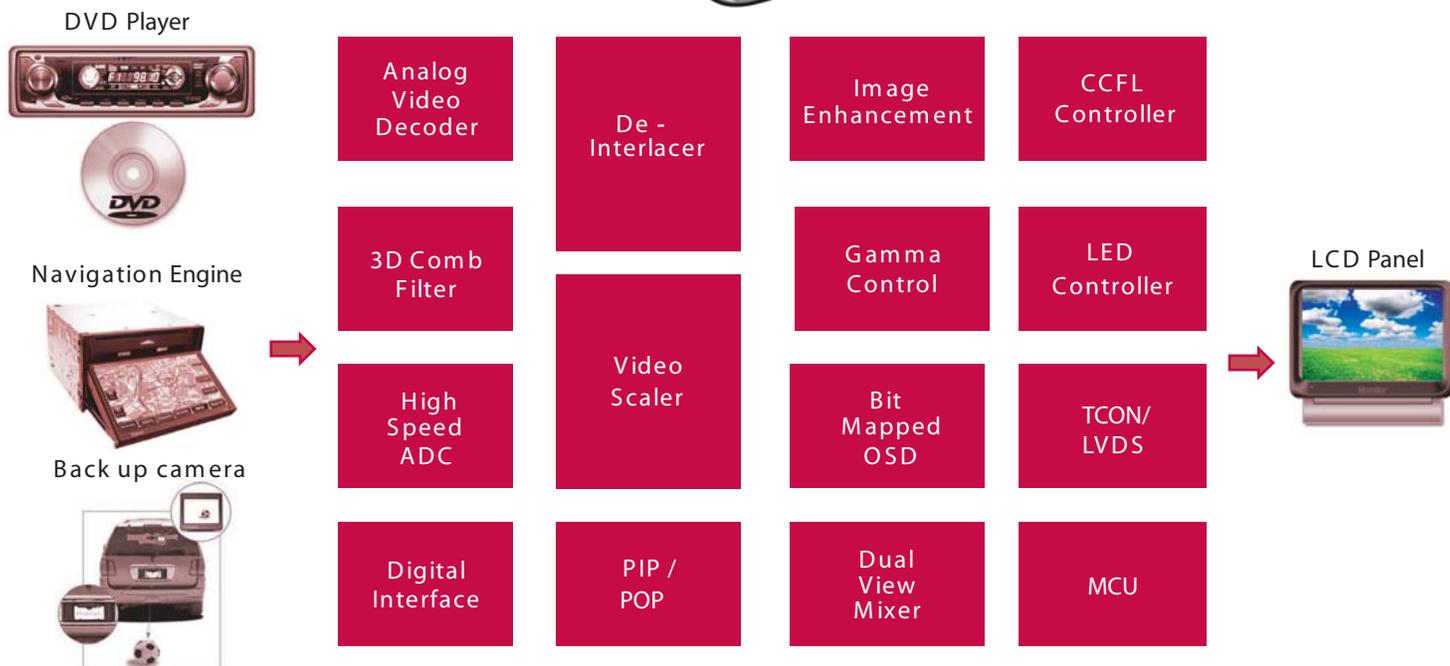
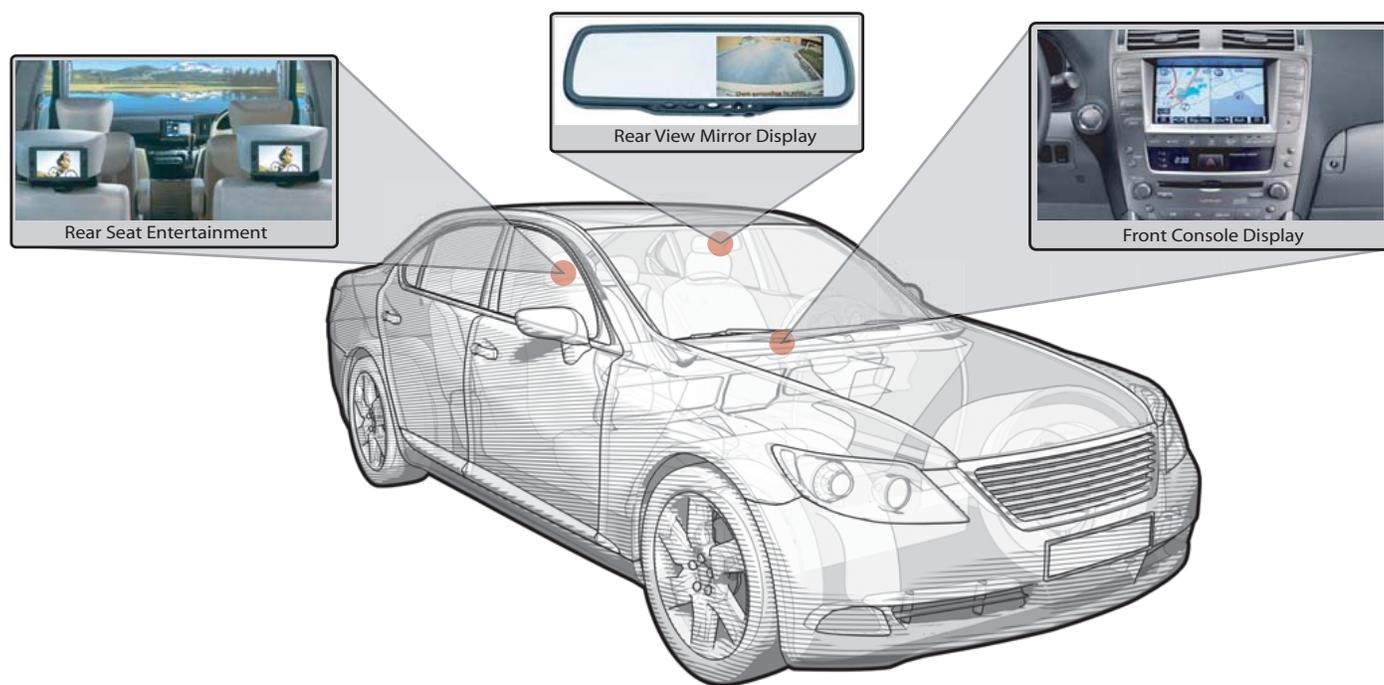
Tel: 1-408-435-3888  
Fax: 1-408-435-0588

Intersil Techwell has one of the largest portfolios of video semiconductor solutions for automotive infotainment display applications. As a pioneer in this market, we have leveraged our extensive mixed signal video and display processing expertise to create unique and robust IC products specifically tailored to the requirements of the automotive display market.

Intersil Techwell's TW88xx automotive infotainment display IC product line is defined by feature rich, highly integrated semiconductor solutions that incorporate many key functions blocks for front console, rear seat entertainment, and rear camera display applications, including an analog video decoder, high quality H/V scaler, 2-D de-interlacer, and embedded timing controllers. In addition, certain TW88xx products include advanced technologies such as a 3D adaptive comb filter, 3D noise reduction, an embedded MCU, a touch-screen controller, 16-bit multi-window OSD, graphic overlay with alpha blending, PIP / POP, dual view display support, and a single channel LVDS interface to directly drive LVDS based LCD panels.

In conjunction with our broad product portfolio, Intersil Techwell has significant system expertise and excellent local support throughout the world, giving our customers the confidence and ability to implement our products in their next generation of automotive infotainment solutions in a timely, cost effective manor.

The TW88xx product line is designed for OEM Automotive applications and therefore support the -40°C to +85°C temperature range and are AEC-Q100 qualified.



		TW8823	TW8813	TW8810	TW8811
Input	CVBS	Yes	Yes	Yes	Yes
	S-Video	Yes	Yes	Yes	Yes
	YPbPr	Yes	Yes	Yes	Yes
	SCAR T	Yes	Yes	Yes	Yes
	Analog RGB	Yes	Yes	Yes	Yes
	Digital RGB/YCbCr	2 Ports	2 Ports	24-bit	24-bit
	ADC	108MHz	108MHz	108MHz	108MHz
Display Processing	Comb Filter	3D	3D	3D	3D
	Max Resolution	WXGA	WXGA	WVGA	WXGA
	De-interlacer	2D	2D	2D	2D
	Black/White Stretch	Dynamic	Dynamic	Dynamic	Dynamic
	Color Enhancement	Yes	Yes	Yes	Yes
	PIP	2 PIP engines	2 PIP engines	Yes	Yes
OSD	Type	Graphic / Bit-map	Graphic / Bit-map	Graphic / Bit-map	Graphic / Bit-map
	SPI OSD	No	No	No	No
	Font ROM (# of characters)	NA	NA	NA	NA
	Font RAM (# of characters)	NA	NA	NA	NA
	Display RAM	NA	NA	NA	NA
	Colors	65K Colors / 24-bit Palette	256 Colors / 24-bit Palette	256 Colors / 24-bit Palette	256 Colors / 24-bit Palette
Output	External OSD	Analog, Digital 18-bit & PIP overlay	Analog, Digital 18-bit & PIP overlay	18-bit	Analog, Digital 18-bit & PIP overlay
	TCON	Digital & Analog	Digital & Analog	Digital & Analog	Digital & Analog
	Dual View	No	No	Yes-Sharp	No
	LVDS	Yes	Yes	No	No
	TTL	Yes	No	Yes	Yes
	Delta RGB	No	No	No	No
Other	CVBS Out	Yes (Y+C Out)	Yes (Y+C Out)	Yes (Y+C Out)	Yes (Y+C Out)
	Memory Support	DDR	SDRAM	SDRAM	SDRAM
	MCU	Integrated	External	External	External
	CCFL / LED Controller	CCFL & LED	CCFL & LED	No	CCFL & LED
	Touch-screen Controller	Yes	No	No	No
	DC-DC Converter	No	No	No	No
Temp Spec	-40C to +85C	-40C to +85C	-40C to +85C	-40C to +85C	

## TW88xx Comparison Table

TW8816	TW8832(S)	TW8833(S)	TW8826	TW8817	TW8827
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes (480i)	Yes	No	No
No	No	No	No	No	No
Yes	Yes (SVGA)	No	Yes	No	No
24-bit	8-bit	No	24-bit	No	16-bit
80MHz	60MHz	NA	27MHz	NA	NA
2D	2D	2D	2D	2D	2D
WXGA	SVGA	WQVGA	WQVGA	SVGA	WQVGA
2D	2D	2D	2D	2D	2D
Dynamic	Static	Static	Dynamic	No	No
Yes	No	No	Yes	Yes	Yes
No	No	No	No	No	No
Font	Font	Font	Font	Font	Font
No	Yes (TW8832S)	Yes (TW8833S)	No	No	No
202	NA	NA	202	202	202
227	256	256	227	75	75
512	384	384	512	256	256
8 x 2 Color / 8-bit Palette	16 Colors / 16-bit Palette	16 Colors / 16-bit Palette	8 x 2 Color / 8-bit Palette	8 x 2 Colors / 8-bit Palette	8 x 2 Color / 8-bit Palette
No	No	Analog/Digital	No	No	No
Digital & Analog	Digital	Analog	Analog	Digital	Analog
No	No	No	No	No	No
No	No	No	No	No	No
Yes	Yes	No	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes	Yes
Yes (Y+C Out)	No	No	Yes (Y+C Out)	Yes (Y+C Out)	Yes (Y+C Out)
No	No	No	No	No	No
Integrated	External	External	Integrated	Integrated	Integrated
CCFL & LED	LED	LED	CCFL & LED	CCFL & LED	CCFL & LED
No	No	No	No	No	No
No	Yes	Yes	No	No	No
-40C to +85C	-40C to +85C	-40C to +85C	-40C to +85C	-40C to +85C	-40C to +85C

# TW8823



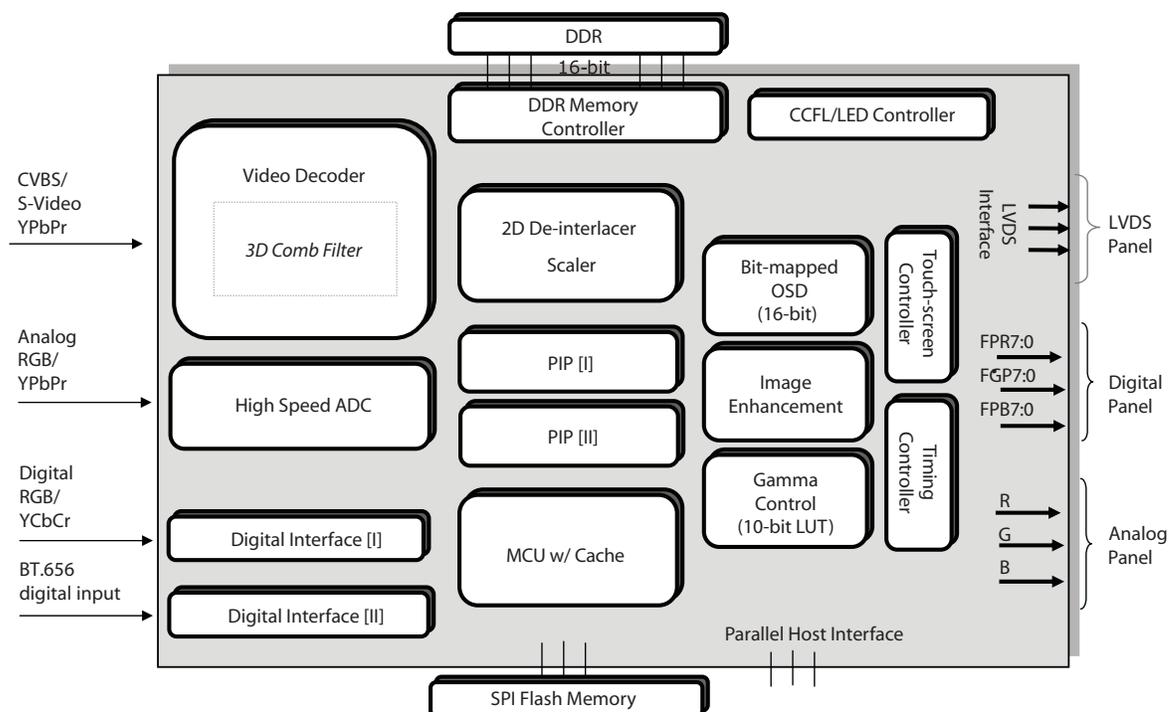
**Advanced LCD controller with on-chip MCU and 65K color 16-bit OSD support**

The TW8823 is a highly integrated advanced LCD controller designed for the automotive infotainment market, targeting center console and rear seat entertainment applications. Features such as an embedded MCU, LED/CCFL backlight controllers, a 4-wire touch screen controller, analog and digital TCON, and a multi-window 16-bit (65K color) bit-map OSD are designed to reduce the system's overall BOM cost. The TW8823 has multiple analog and digital inputs to support a wide array of video and graphic sources, including navigation modules, back-up cameras, DVD/multimedia modules, PCs, etc. The TW8823 can support a wide variety of both digital & analog LCD panels with resolutions up to WXGA, and also has an integrated single channel LVDS interface to directly drive LVDS based LCD panels.

## Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr
- Dual channel digital inputs support with following combinations:
  - 1 channel 18/16-bit inputs and 1 channel 8-bit inputs
  - 1 channel 24-bit digital RGB/YCbCr inputs
- Integrated 8052 MCU with on-chip cache and SPI DMA support for Read/Write to OSD memory
- 16-bit (65K colors)/8-bit (256 colors) based bit-map OSD support. External 18-bit OSD supported with alpha blending control
- Embedded image enhancement functions:
  - 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

## TW8823 Functional Block Diagram





# TW8823

Advanced LCD controller with on-chip MCU  
and 65K color 16-bit 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
- Two 10-bit ADCs and analog clamping circuit
- Software selectable analog inputs allows either composite or S-video input
- High quality motion adaptive 3D comb filter for both NTSC and PAL with concurrent 3D noise reduction
- Digital horizontal PLL and advanced synchronization processing for VCR playback and weak signal performance
- Programmable hue, brightness, saturation, contrast, sharpness

## Analog RGB Inputs

- Triple high speed 10-bit ADCs
- Built-in line locked PLL with sync separator
- Supports analog input resolution up to 1080i or WXGA

## Dual Digital Inputs Support

- Dual channel digital inputs support with following combinations:
  - 1 channel 18/16-bit inputs and 1 channel 8-bit inputs
  - 1 channel 24-bit digital RGB/YCbCr inputs
- Supports both 656 and 601 video formats

## Built-in Microcontroller

- Built-in 8052 MCU up to 72MHz clock
- Built-in code cache memory to enhance CPU performance
- Supports Single/Dual/Quad IO SPI Flash
- System programming through UART
- Supports SPI DMA Read/Write to OSD memory
- Supports IR receiver and interrupt output

## FTP Panel Support

- Built-in analog and digital TCON with programmability
  - Support for both digital & analog LCD panels with resolutions up to WXGA
  - Integrated single channel LVDS interface to directly drive LVDS based LCD panels

## Memory Support

- Integrated 16-bit DDR memory controller supporting DDR-SDRAM up to 256Mb

## On Screen Display

- Supports three window bit-mapped OSD, one 16-bit (65K colors) and two 8-bit (256 colors) bit-mapped OSD windows
  - Built-in OSD controller with Bit Blit Engine
  - Supports variety functions included like blinking, transparency and blending
  - Supports External OSD with external alpha blending control
  - Supports OSD compression

## Image Processing

- High quality scaler with both up and down scaling support
- Built-in 2D de-interlacer
- Programmable hue, brightness, saturation, contrast and sharpness
- Panorama/Water-glass scaling
- Programmable 10-bit Gamma correction for each color
- Black/White Stretch
- Programmable favorite color enhancement

## PIP Function

- Two independent PIP engines
- Supports both 16-bit YPbPr and RGB data format

## Host Interface

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

## Power Management

- Supports Panel power sequencing
- Supports DPMS for monitor power management
  - 1.8V / 2.5V / 3.3V operation

## Miscellaneous

- Built-in single CCFL and LED backlight controller
- Built-in Touch screen controller with 12-bit ADC
- LVR, provides 100~200 msec. low voltage reset
- Power-down mode
- Single 27MHz crystal

# TW8813

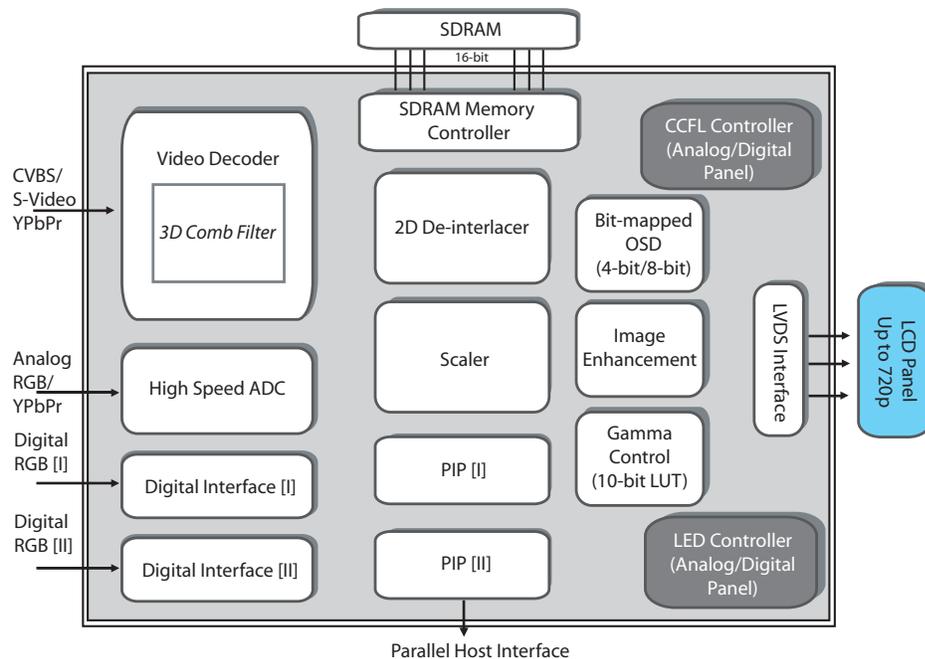
## 3D Video Decoder based LCD controller with built-in LVDS panel interface

TW8813 is a highly integrated and flexible LCD controller for the automotive infotainment market's front console and rear seat entertainment applications. TW8813 integrates an 8-bit single channel LVDS panel interface to directly drive LVDS LCD panels up to 720p resolution. The TW8813 also features a built-in 3D comb filter based analog video decoder, high quality H/V scaler, 2D de-interlacer, TCON, CCFL and LED backlight controllers, as well as a bit-map OSD engine. This versatile device can support a wide variety of analog inputs and also features two digital RGB inputs.

### Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr
- Configurable Digital RGB input port to support either a single 24-bit Digital RGB input or two 18-bit Digital RGB inputs
  - Both interlaced and progressive ITU 656 and 601 formats supported
- LVDS panel interface (single channel) to drive LVDS LCD panels directly, up to 720p resolution
- Integrated 16-bit SDRAM memory controller supporting external SDRAM up to 8MB
- 2 PIP engines built-in
- Dual window bit-map OSD (4/8-bit)
- External 18-bit 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 #	Package	Description	Pin Count	Body Size
TW8813	LQFP 208	Low Profile Quad Flat Package	208	28 x 28 mm <sup>2</sup>

# TW8810

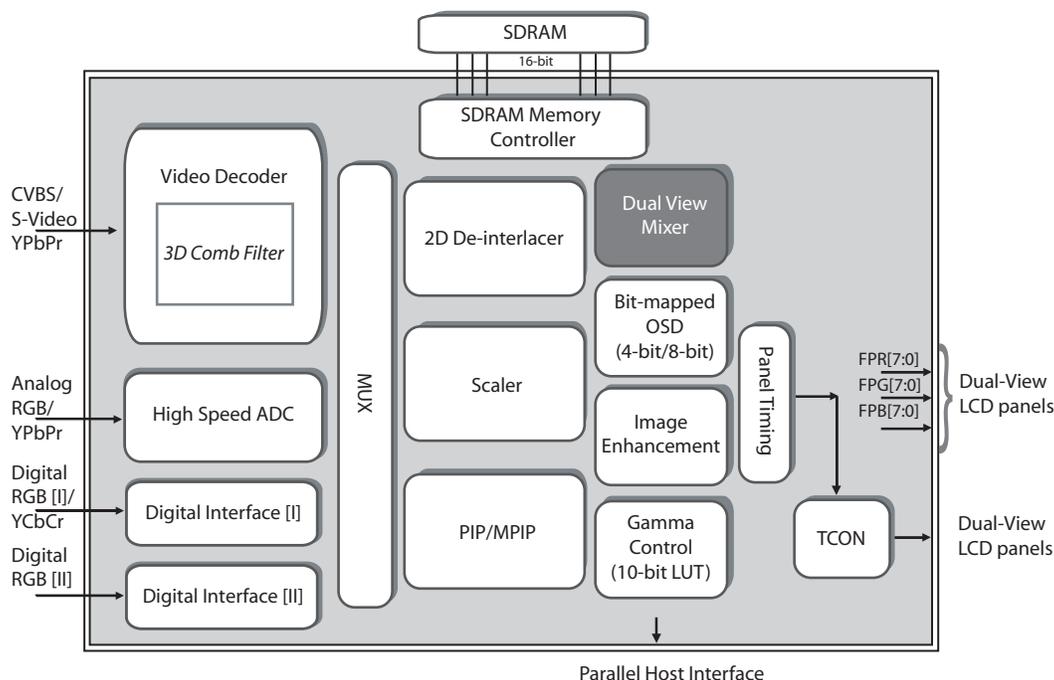
**3D Video Decoder based on LCD controller  
for Dual-View LCD panels**

The TW8810 is a highly integrated LCD controller for Dual-View LCD panels primarily targeting front console and rear-seat automotive infotainment applications. The TW8810 integrates a high quality NTSC/PAL/SECAM 3D video decoder and a 2D de-interlacer with low angle compensation. In addition, a built-in dual-view mixer enables direct support for Dual-View LCD panels.

## Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr
- Configurable Digital RGB input port to support either a single 24-bit Digital RGB input or two 18-bit Digital RGB inputs
  - Both interlaced and progressive ITU 656 and 601 formats supported
- Supports Dual-View LCD panels with resolutions up to WVGA
- Integrated low cost 16-bit SDRAM memory controller supporting up to 8MB SDRAM external memory
- Supports PIP/POP
- Built-in dual-view mixer block to support both stripe barrier and step barrier dual-view pixel matrix
- Built-in dual window bit-mapped (4/8-bit) 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

## TW8810 Functional Block Diagram



## Order Information

Part #	Package	Description	Pin Count	Body Size
TW8810	LQFP 208	Low Profile Quad Flat Package	208	28 x 28 mm <sup>2</sup>

# TW8811

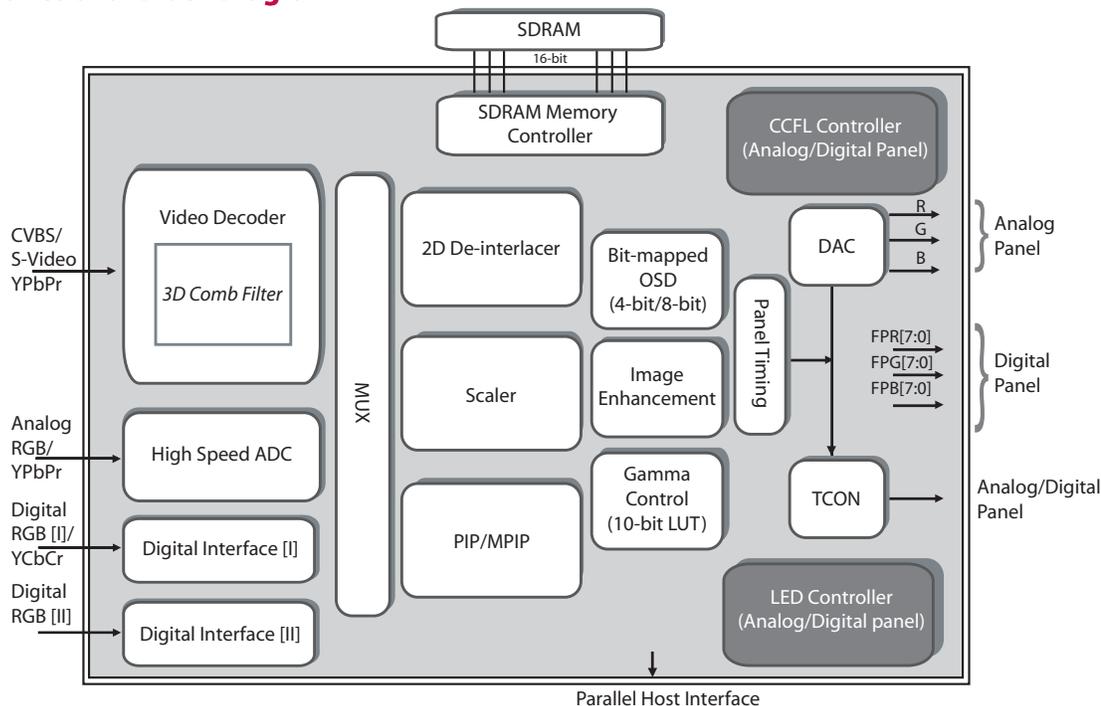
## 3D Video decoder based on LCD controller with PIP, Graphic OSD & CCFL/LED controller

The TW8811 is a highly integrated multi-purpose LCD controller with a NTSC/PAL/SECAM 3D video decoder and a 2D De-interlacer/Scaler targeting automotive infotainment applications. Through multiple input ports, TW8811 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.

### Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr
- Configurable Digital RGB input port to support either a single 24-bit Digital RGB input or two 18-bit Digital RGB inputs
  - Both interlaced and progressive ITU 656 and 601 formats 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-bit) 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 #	Package	Description	Pin Count	Body Size
TW8811	LQFP 208	Low Profile Quad Flat Package	208	28 x 28 mm <sup>2</sup>

# TW8816

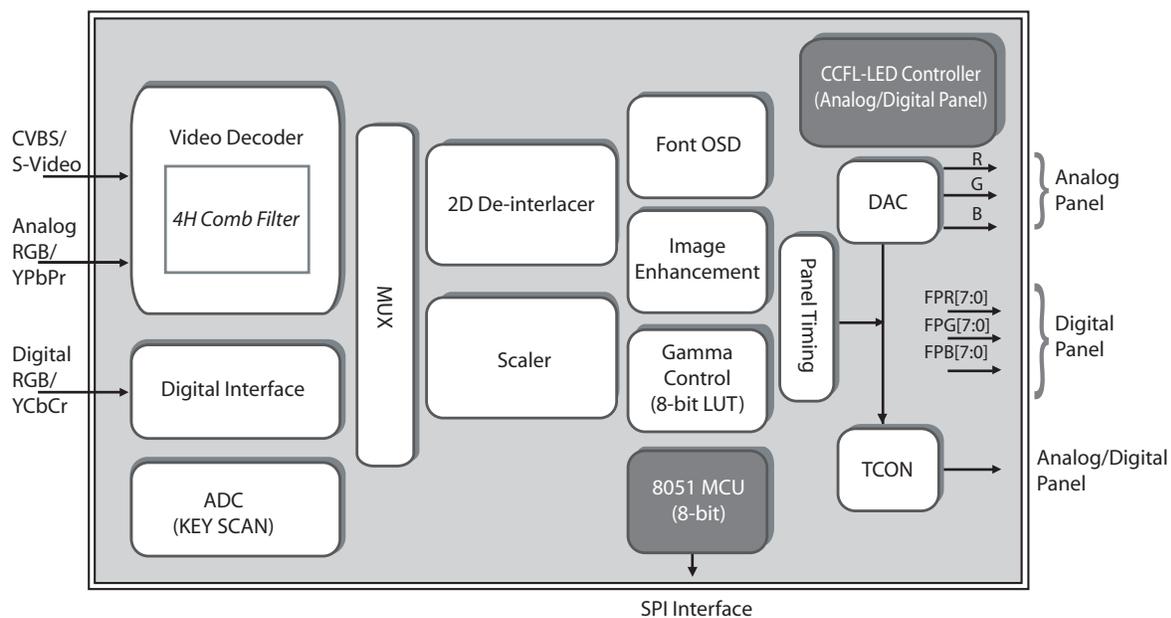
Highly Integrated LCD controller  
with on-chip MCU & CCFL-LED controller

The TW8816 is a highly integrated multi-purpose LCD display solution with a high quality NTSC/PAL/SECAM 2D video decoder and a 2D video decoder, 2D de-interlacer, and H/V scaler, supporting both digital and analog panels. To reduce BOM cost, TW8816 integrates an 8-bit MCU and a CCFL/LED backlight controller. Through multiple input ports, TW8816 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.

## Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr
- Supports digital inputs including 8/16/24-bit RGB/YCbCr
  - Both interlaced and progressive ITU 656 and 601 format supported
- Supports both digital & analog panels up to WXGA resolutions
- Integrates cost saving features including a CCFL/LED backlight controller & an on-chip 8-bit 8051 based MCU with SPI interface
- Built-in 8 color Font OSD with 202 ROM fonts and 227 programmable 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
  - Programmable Gamma Correction tables

## TW8816 Functional Block Diagram



## Order Information

Part #	Package	Description	Pin Count	Body Size
TW8816	LQFP 128	Low Profile Quad Flat Package	128	14 x 20 mm
TW8816	BGA 144	Ball Grid Array Package	144	7 x 7 mm <sup>2</sup>

# TW8832(S)

**NEW  
PRODUCT**

**Cost-effective, highly integrated LCD controller for digital LCD panels**

The TW8832 is a highly integrated cost-effective LCD controller supporting digital LCD panels. TW8832 integrates a high quality NTSC/PAL/SECAM 2D comb video decoder, 2D de-interlacer, and an improved H/V scaling engine. Additional features include a robust font-based OSD engine, independent mirroring functionality for the scaler and OSD, serial RGB output, and an LED backlight controller. The TW8832S version also supports a proprietary SPI Bitmap OSD.

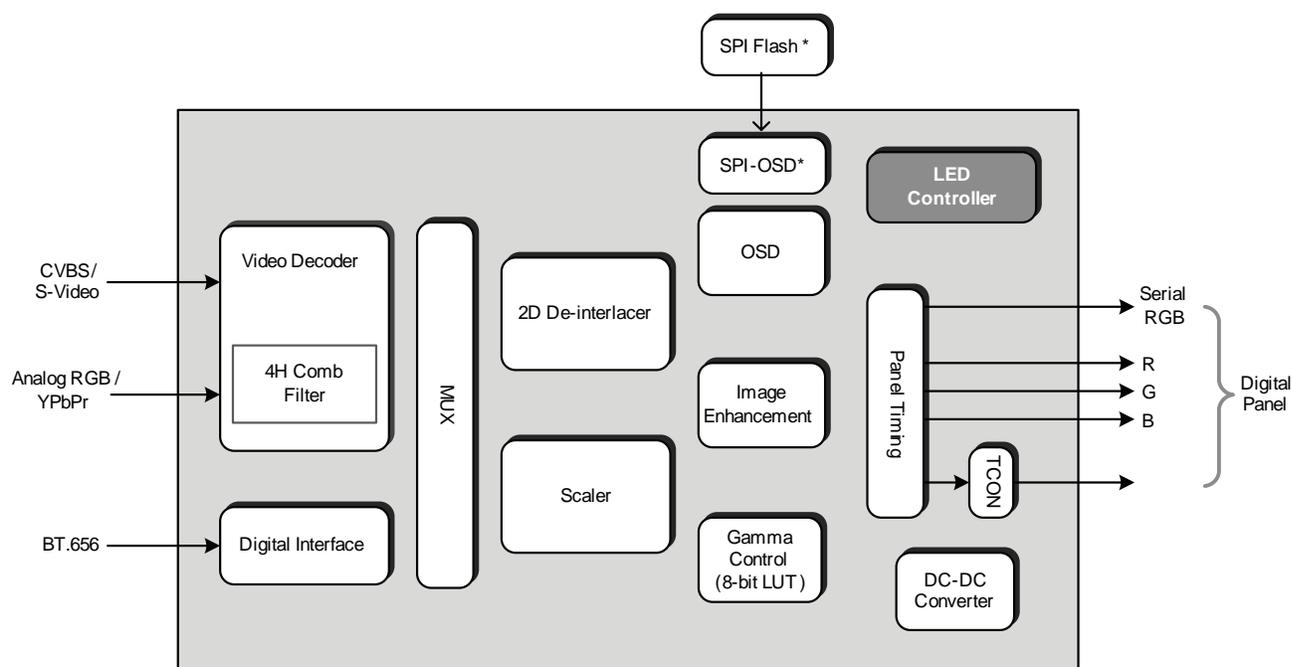
## Target Applications

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

## Key Features

- Supports analog inputs including CVBS, S-Video, and Analog RGB/YPbPr (480p)
- Digital input interface supporting BT.656
- Drives digital panel up to SVGA resolution
  - Digital RGB with TCON or serial digital RGB
- Built-in font-based OSD with 256 programmable fonts and a 384 character display RAM
- Integrated LED backlight controller (single string)
- Supports VCOM-DC, VCOM-AC and spread spectrum clock
- Independent mirror function for the scaler and the OSD
- Embedded Image Enhancement
  - Programmable CTI, hue, brightness, saturation, contrast & sharpness control
  - Black/White Stretch
  - Programmable Gamma Correction table

## TW8832 Functional Block Diagram





# TW8832(S)

Cost-effective, highly integrated LCD controller for digital LCD panels

## Analog Video Decoder

- NTSC (M, 4.34), PAL (B, D, G, H, I, M, N combination), PAL (60), SECAM with automatic format detection
- Digital BT.656 input interface port
- 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
  - Analog RGB/YCbPr (480p)
- 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 panels up to SVGA
- Supports 3, 4, and 6 bits per pixel format
- Supports serial RGB output

## Font OSD

- Built-in Font OSD with 256 programmable fonts and 384 character display RAM. Supports Multi-color fonts by combining 3 single color fonts
- Multi-window OSD support with color pallet
- Support OSD overlay with alpha blending

## SPI OSD\* (for TW8833S Only)

- 8 bit bitmap OSD Support
- 2 OSD Windows

## Image Processing & Enhancement

- Built-in 2D de-interlacing engine
- Improved high quality H/V scaler engine
- Mirror function (scaler and OSD independently)
- 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

## LED Controller

- Boost-up
- DC and PWM Dimming Control
- Built-in Open LED Protection

## Timing Controller (TCON)

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

## Miscellaneous

- Supports 2-wire serial bus interface
- Spread spectrum clock support
- VCOM-DC, VCOM-AC, DC-DC converter
- Programmable panel VCOM offset control
- 5V tolerant I/O
- Power-down mode
- Single 27MHz crystal
- 1.8 / 3.3V operation
- Temperature rating: -40 C to +85 C
- 80-pin LQFP package

# TW8833(S)



**Advanced LCD controller with on-chip MCU and 65K color 16-bit OSD support**

The TW8833 is a highly integrated cost-effective LCD controller supporting analog LCD panels. TW8833 integrates a high quality NTSC/PAL/SECAM 2D comb video decoder, 2D de-interlacer, and an improved H/V scaling engine. Additional features include a robust font-based OSD engine, independent mirroring functionality for the scaler and OSD, serial RGB output, and an LED backlight controller. The TW8833S version also supports a proprietary SPI Bitmap OSD.

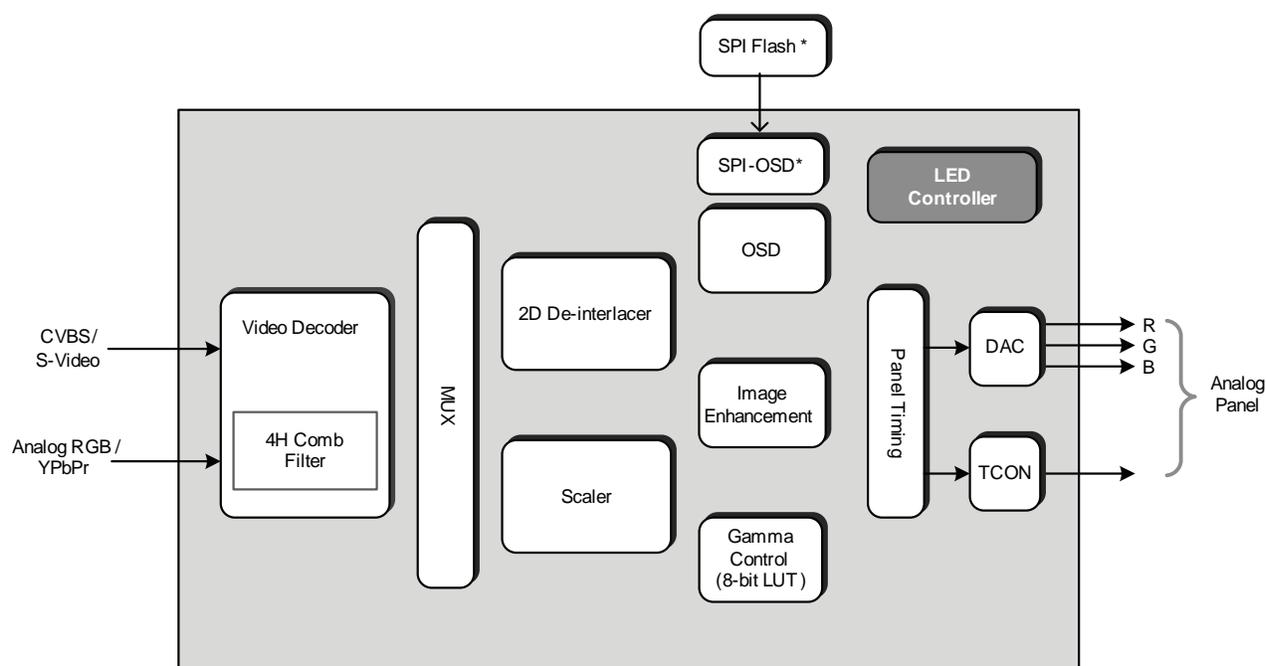
## Target Applications

- Navigation + DVD + TV
- Back up Camera
- Rear Seat Entertainment
- Car TV
- Portable DVD
- PMP / PND / Portable TV
- Door Phone
- Photo Frame
- DMB TV
- Baby Monitor
- Home Automation

## Key Features

- Supports analog inputs including CVBS, S-Video, and 480i Component (YPbPr)
- Drives analog panels up to WQVGA resolution
  - Analog TCON with delta RGB support
- Built-in font-based OSD with 256 programmable fonts and a 384 character display RAM
- Integrated LED backlight controller (single string)
- Supports VCOM-DC, VCOM-AC and spread spectrum clock
- Independent mirror function for the scaler and the OSD
- Embedded Image Enhancement
  - Programmable CTI, hue, brightness, saturation, contrast & sharpness control
  - Black/White Stretch
  - Programmable Gamma Correction table

## TW8833 Functional Block Diagram





# TW8833(S)

Advanced LCD controller with on-chip MCU  
and 65K color 16-bit OSD support

## Analog Video Decoder

- NTSC (M, 4.34), PAL (B, D, G, H, I, M, N combination), PAL (60), SECAM with automatic format detection
- 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
  - YPbPr (480i)
- 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 analog active matrix TFT panels
- Supports analog panels up to WQVGA (480 x 234), 20MHz

## Font OSD

- Built-in Font OSD with 256 programmable fonts and 384 character display RAM. Supports Multi-color fonts by combining 3 single color fonts
- Multi-window OSD support with color pallet
- Support OSD overlay with alpha blending

## SPI OSD\* (for TW8833S Only)

- 8 bit bitmap OSD Support
- 2 OSD Windows

## Image Processing & Enhancement

- Built-in 2D de-interlacing engine
- Improved high quality H/V scaler engine
- Mirror function (scaler and OSD independently)
- 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

## LED Controller

- Boost-up
- DC and PWM Dimming Control
- Built-in Open LED Protection

## Timing Controller (TCON)

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

## Miscellaneous

- Supports 2-wire serial bus interface
- Spread spectrum clock support
- VCOM-DC, VCOM-AC, DC-DC converter
- Programmable panel VCOM offset control
- 5V tolerant I/O
- Power-down mode
- Single 27MHz crystal
- Triple 5V DAC
- 1.8 / 3.3V operation
- Temperature rating: -40 C to +85 C
- 48-pin QFN package

# TW8826

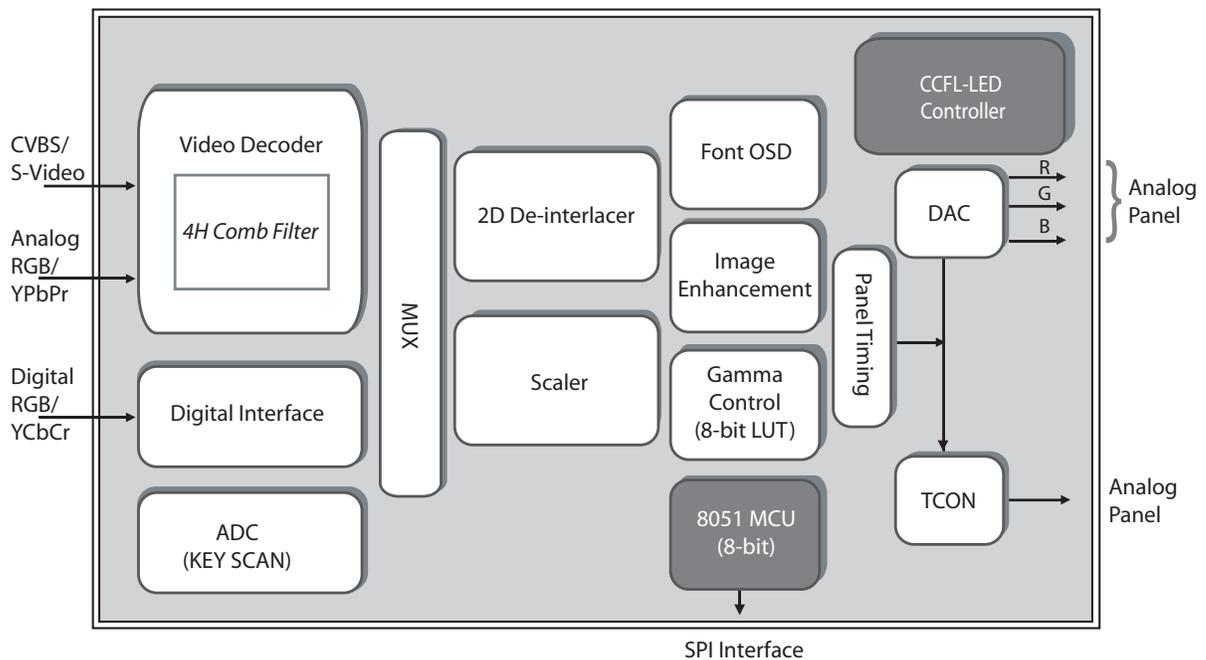
**Ultra low cost, highly integrated  
LCD controller for analog panels**

The TW8826 is a low cost highly integrated multi-purpose LCD display solution with a high quality NTSC/PAL/SECAM 2D video decoder, 2D de-interlacer, and H/V scaler, supporting analog panels. To reduce BOM cost, TW8826 integrates an 8-bit MCU and a CCFL/LED backlight controller. Through multiple input ports, TW8826 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.

## Key Features

- Supports analog inputs including CVBS, S-Video & Analog RGB/YPbPr
- Supports digital inputs including 8/16/24-bit RGB/YCbCr
  - Both interlaced and progressive ITU 656 and 601 format supported
- Supports analog panels up to WQVGA resolutions
- Integrates cost saving features including a CCFL/LED backlight controller, charge pump booster, programmable panel offset control and on-chip 8-bit 8051 MCU with SPI interface
- Built-in 8 color font based OSD with 202 ROM fonts and 227 programmable RAM fonts. Supports Multi-color fonts by combining three 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
  - Programmable Gamma Correction tables

## TW8826 Functional Block Diagram



## Order Information

Part #	Package	Description	Pin Count	Body Size
TW8826	LQFP 128	Low Profile Quad Flat Package	128	14 x 20 mm

# TW8817

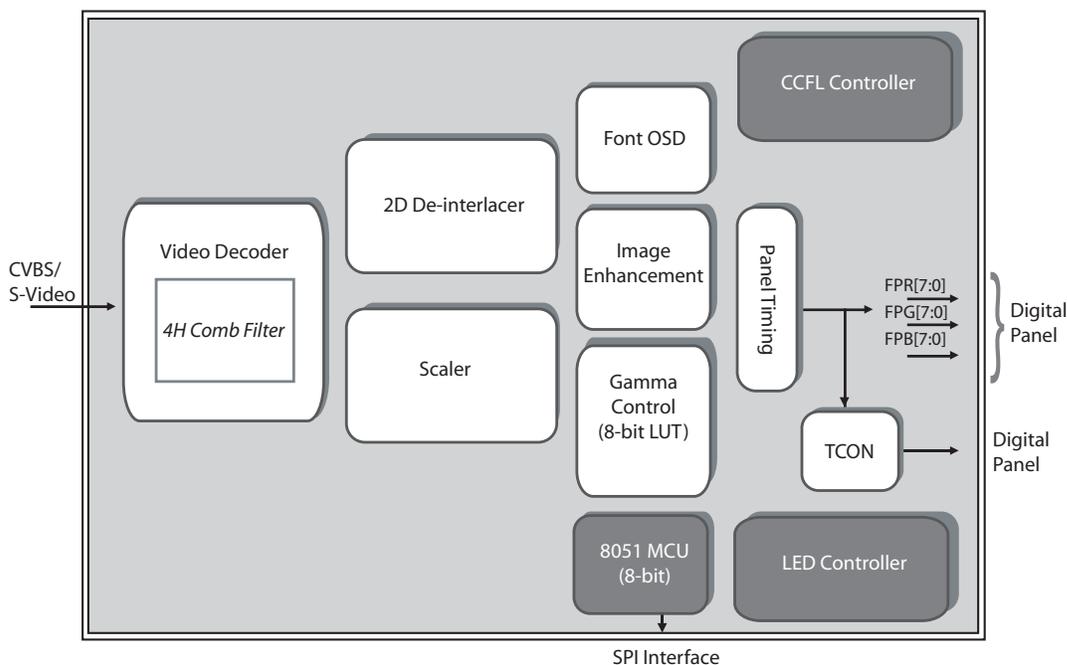
Low cost, highly integrated LCD controller for digital LCD panels

The TW8817 is a highly integrated low cost TFT flat panel controller supporting digital panels. To help reduce the system BOM cost, TW8817 integrates an 8-bit MCU and a CCFL / LED backlight controller. The TW8817 has a high quality NTSC/PAL/SECAM 2D video decoder and a 2D video decoder, 2D de-interlacer, and H/V scaler.

## 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 backlight controller
- Built-in 8 color font based OSD with ~200 ROM & 75 RAM fonts. Supports Multi-color fonts by combining three 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 #	Package	Description	Pin Count	Body Size
TW8817	TQFP 80	Thin Quad Flat Package	80	12 x 12 mm <sup>2</sup>

# TW8827

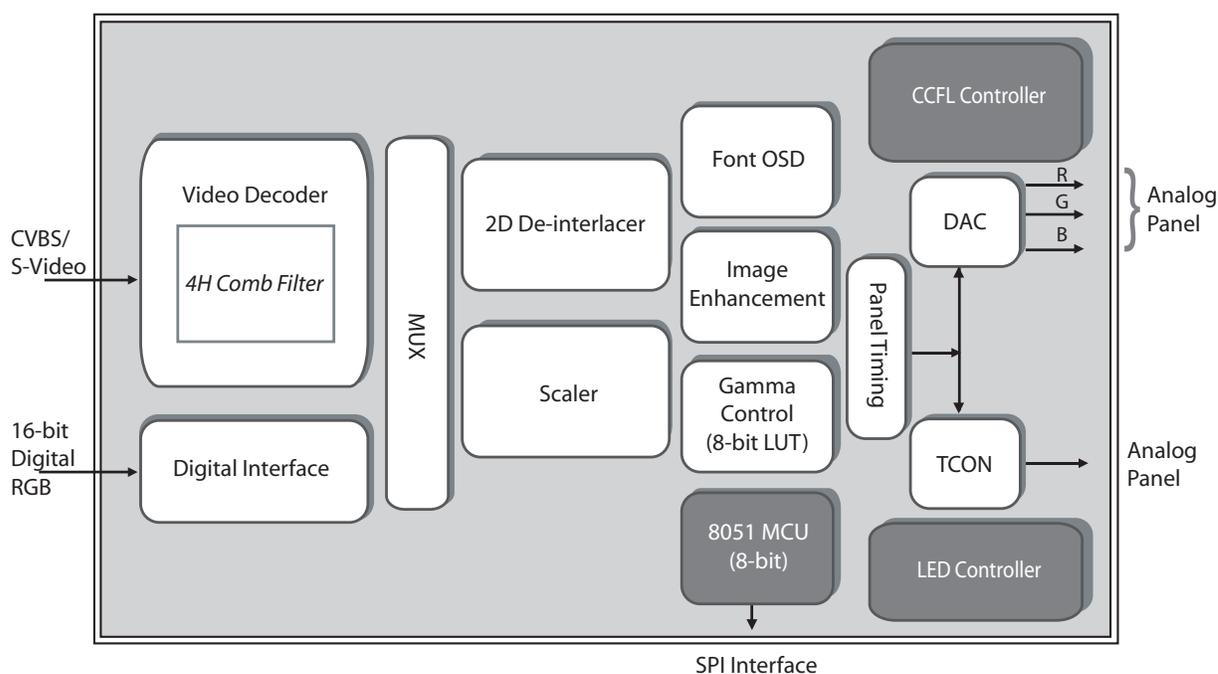
**Ultra low cost, highly integrated  
LCD controller for analog LCD panels**

The TW8827 is an ultra low cost, highly integrated LCD controller supporting analog panels. To reduce BOM cost, TW8827 integrates an 8-bit MCU, a CCFL controller and a LED controller. The TW8827 has a high quality NTSC/PAL/SECAM 2D video decoder, 2D de-interlacer, and H/V scaler. In addition, the built-in digital interface supports 16-bit digital RGB/YCbCr inputs.

## Key Features

- Supports analog inputs including CVBS & S-Video
- Supports 16-bit digital RGB/YCbCr input
  - Both interlaced and progressive ITU 656 and 601 format 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 #	Package	Description	Pin Count	Body Size
TW8827	TQFP 80	Thin Quad Flat Package	80	12 x 12 mm <sup>2</sup>

## INTERSIL'S AUTOMOTIVE SOLUTIONS

Intersil, with a proven history of providing innovative and highly reliable ICs for the space, consumer, computing, and industrial markets, is uniquely qualified to meet the challenging requirements of the automotive industry.

Over the past few years Intersil has invested in key technologies to address the current mega trends within the automotive market such as environment, safety, information and affordability.

This effort has resulted in leadership positions in high performance power conversions, state-of-the-art precision analog, cell balancing and battery charging ICs, power-efficient class D audio amplifiers, and highly-flexible TFT display controllers.

Intersil has also invested in TS16949 certification of internal fabs and the development of proprietary process technologies (including smart power) for automotive. Intersil, with a strong balance sheet and a dedicated organization of automotive professionals, is committed to delivering world class automotive solutions for you and your customers.



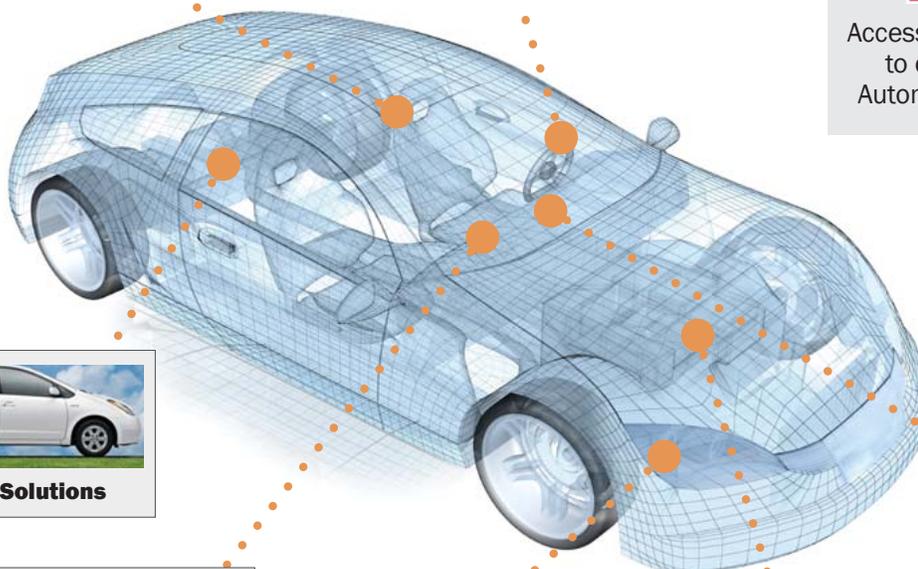
**Infotainment**



**Driver Assistance**



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**EV/HEV Solutions**



**Bird's Eye Display**



**Interior Cabin Lighting**



**Exterior Lighting**



**Rear Camera Display (RCD)**



**Electronic Motor Controls**

**Corporate Headquarters**

Intersil Corporation Headquarters  
1001 Murphy Ranch Road  
Milpitas, CA 95035  
TEL: (408) 432-8888  
FAX: (408) 434-5351  
1-888-INTERSIL  
1-888-468-3774

**China Sales**

Tel: 86-755-8294-5668  
Fax: 86-755-8294-5607

**Japan Sales**

Tel: +81-3-5488-TWLL (8955)  
Fax: +81-3-5488-8957

**Korea Sales**

Tel: 82-31-713-8480  
Fax: 82-31-713-8481

**Taiwan Sales**

Tel: 886-2-8751-0280  
Fax: 866-2-8751-0206

**North and South America Sales**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

**EMEA Sales**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

**India and Southeast Asia Sales**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

**For all other regions, please contact:**

Tel: 1-408-435-3888  
Fax: 1-408-435-0588

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