



**TECHWELL
DISPLAY**



Automotive Display ICs

TW8823

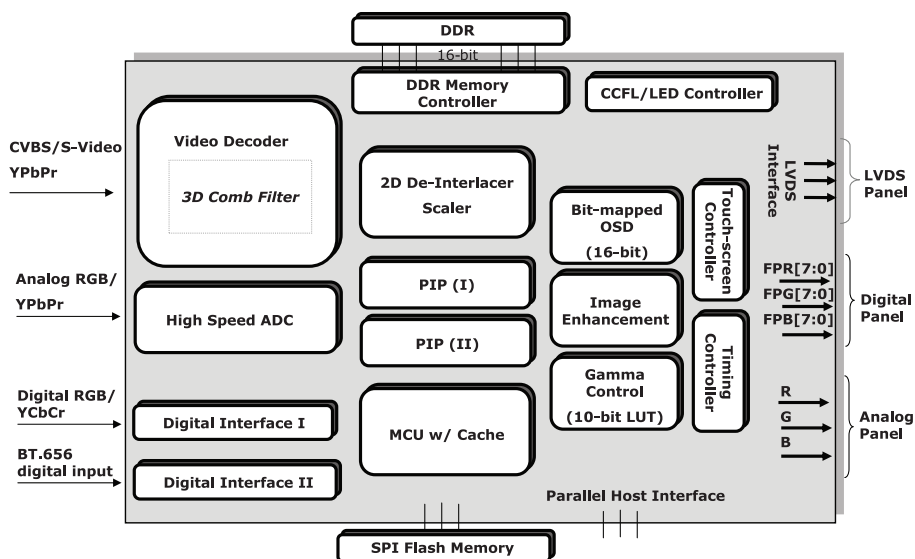
Advanced LCD controller with on-chip MCU and 65K color 16-bit OSD support

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

TFT 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

About Techwell

Techwell is a fabless semiconductor company that designs, markets and sells mixed signal integrated circuits in the security surveillance, automotive infotainment, and consumer markets. Founded in 1997, we currently have over 200 employees and are headquartered in San Jose, California, with additional R&D and sales activities in South Korea, Japan, Taiwan and China.

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