

# SAA6713

## XGA Dual-input

## TFT-Display Controller



### Features

#### Input Interfaces

- DVI 1.0-compliant TMDS input including high-bandwidth digital content protection (HDCP), 110 MHz
- Analog VGA input with clamp and automatic gain control, 110 MHz
- Maximum resolution 1280x1024 pixels

#### Input Auto Detection

- Detection of presence and polarities of sync signals
- Measurement of horizontal and vertical update frequencies
- Statistical measurements assist in adjustment of sample clock frequency, vertical and horizontal sample offset, and ADC parameters

#### Input Processing

- Advanced color processing for luminance, separate color saturation and R, G, and B contrast and brightness
- Phase-correct downscaling of any input data

#### Output Processing

- Upscaler with independent vertical/horizontal parameters
- Arbitrary upscale ratio from 1 to 64
- Programmable polyphase filter supports picture adjustments from smoothing to sharpening
- Color correction look-up table (256x10 bits, e.g. for gamma correction)
- Temporal dithering for 10-bit virtual precision on 8- and 6-bit displays

*(Features continued on reverse)*

### Description

The Philips SAA6713 is a highly integrated, dual-input LCD controller IC. It inputs analog VGA and DVI 1.0-compliant TMDS signals and performs all needed signal processing and measurement before output to an XGA LCD panel.

The SAA6713 incorporates many high-performance features to enhance picture quality and optimize contrast. A programmable polyphase filter enables picture adjustment from smoothing to sharpening during upscaling. Sophisticated color management features include a programmable color matrix, 10-bit gamma correction and temporal dithering for 10 bits of virtual precision on 8- and 6-bit displays.

Integrated, feature-rich on-screen display (OSD) functionality facilitates creation of a smart and user-friendly graphical user interface. Both character-based OSD features—including predefined and programmable fonts—as well as a bitmapped graphical OSD are supported.

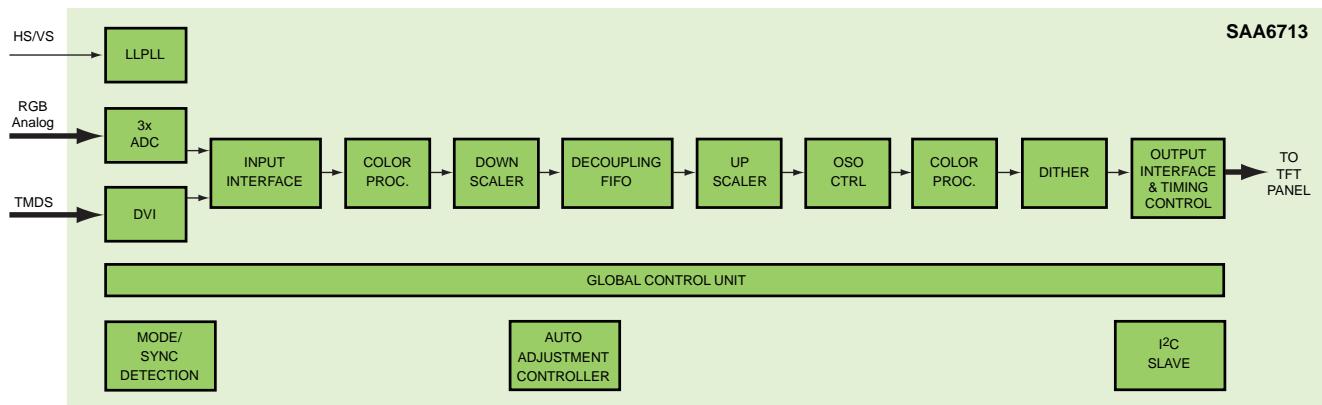
In addition to support for single (24 bit) or double (48 bit) pixel/clock digital RGB output, the SAA6713 can directly interface with the row and column drivers of virtually any manufacturer by integrating a programmable panel timing controller (TCON). It is controlled through a standard 3.4-Mbit I<sup>2</sup>C bus and comes in an easy-to-use PQFP160 package.

*Let's make things better.*



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## SAA6713 Block Diagram

**(Features continued)****On-screen Display (OSD)**

- Programmable character size from 8x8 to 32x32
- Predefined character ROM including 256 characters (icons, etc.)
- 144 built-in character size-independent generators for borders and sliders
- Built-in 4-kB memory for up to 512 additional user definable/downloadable characters of up to 4 colors
- Selectable true-color sets for characters and bit-mapped OSD

- Four-kB bitmapped image RAM, 2 to 16 colors (e.g. for backdrop or company logo)
- Programmable Alpha blending for OSD window and image window
- Double-buffered cursor/pointer RAM (enables MS Windows®-like cursor) for animation
- Text attributes such as shadowing, blinking, inversion and foreground/background transparency

**Output Interface**

- Single pixel/clock (24-bit) or double pixel/clock (48-bit) digital RGB output
- Selectable 6-bit or 8-bit per color mode
- Generation of synchronization and validation signals for TFT displays
- Programmable output timing supports displays of virtually any manufacturer
- Interfaces directly to row and column drivers (TCOn)
- Panel interface drive strength is programmable for EM1 reduction
- Maximum resolution 1024x768 pixels

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