



NXP mobile multimedia processor SAA8510

TV-out on every mobile phone

Designed for use in mobile phones and other portable devices, this processor converts digital video signals into a high-quality analog TV signal that can be displayed on NTSC and PAL TV sets worldwide. It requires no specific clock or voltage supplies, and can be addressed as a simple RAM-based display controller.

Key features

- ▶ MIPI DBI-2 host interface
- ▶ Worldwide support for PAL and NTSC
- ▶ 4-Mbit embedded frame buffer
- ▶ Supports all common mobile resolutions, including VGA @ 30 fps
- ▶ Supports MacroVision copy protection and VBI data insertion
- ▶ Excellent output quality based on a rich filter set and polyphase scalers
- ▶ Advanced power management
- ▶ Fully integrated solution requires no external oscillator or CVBS drivers
- ▶ Smallest package on the market: TFBGA48 (4 x 4 mm, 0.4 pitch)

The SAA8510 enables TV-out on any mobile device that has a standard LCD interface. The 8/16-bit parallel MIPI DBI-2 host interface lets the SAA8510 be addressed as a simple RAM-based display controller, so there are no real-time constraints on the host. In debug mode, the host interface provides direct access to all registers and the internal 4-Mbit frame buffer.

Supported input formats are RGB888, RGB666, RGB565, YUV422, and YUV420 for resolutions from 2 x 2 pixels to a maximum width/height of 864 pixels. (The internal SRAM holds a YUV420 frame buffer of 12 bits per pixel, so any image can be buffered with a width/height of between 2 and 864 pixels, as long as the total image size does not exceed 4 Mbits.) The input frame rate can vary from zero (still picture) to 30 frames per second.

For a simpler design with a lower component count, embedded PLLs let the processor operate based on an input clock of 19.2, 26, 27, or 38.4 MHz. There's no need for an external 27-MHz oscillator.

To extend battery life in mobile applications, the processor includes advanced functions for power management. There are five power modes: power off, deep sleep, sleep in, sleep out, and active. Embedded voltage regulators generate all the required voltage domains, and integrated cable detection saves power when there's no cable or TV set connected.

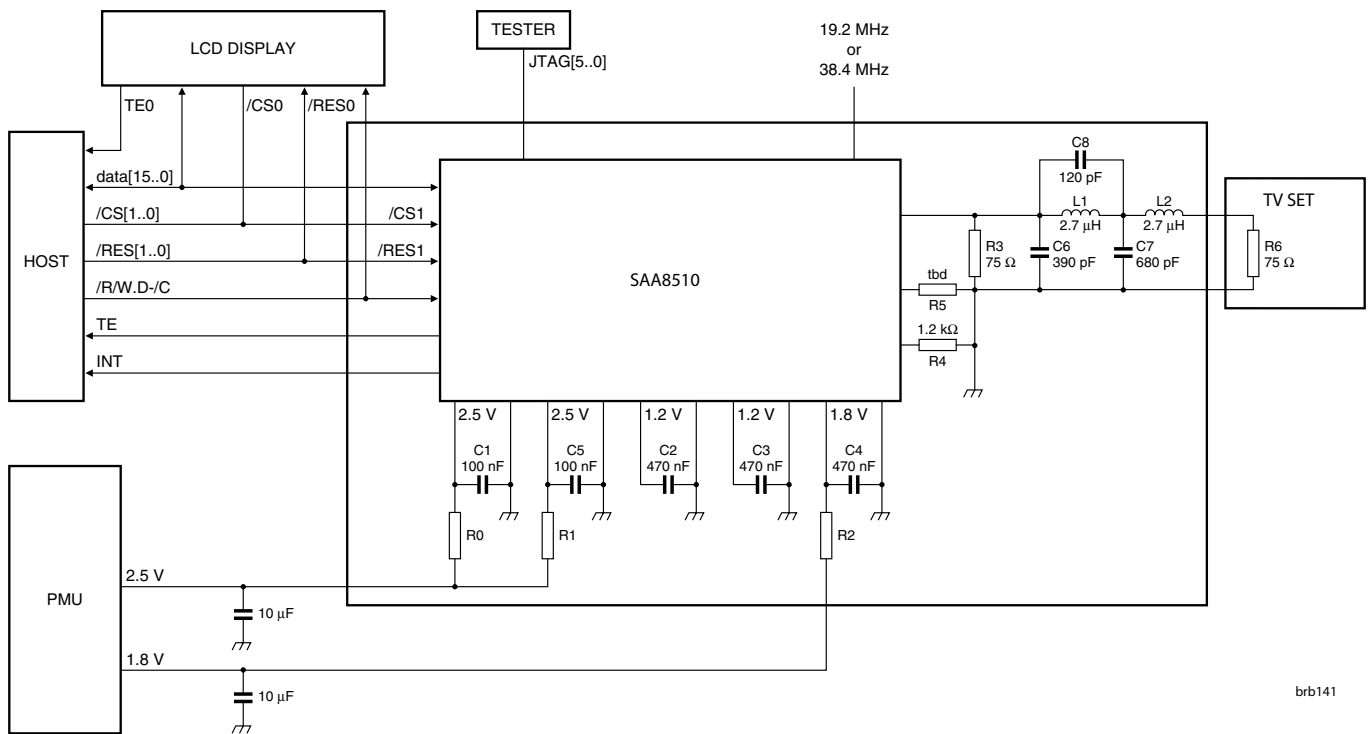
Several features combine to create superior output quality. Polyphase up/down scalers support different scale factors horizontally and vertically, and can be used for square-pixel correction. Chrominance and luminance filters limit the effects of dot crawl, and there is a dedicated TE signal for programmable management of tearing effect. There is color correction, input image cropping, and fully programmable output window size and position. The processor also supports partial video-frame update, programmable background color, and a color-bar test mode.

The TV-out interface supports PAL and NTSC CVBS output formats compliant with ITU-R BT.1700 and SMPTE 170M standards. The analog signal is generated by an embedded 10-bit DAC and terminated at 75 Ω, so no external drivers are required.

The processor supports VBI data insertion at 4:3, 14:9, and 16:9 aspect ratios. It also supports MacroVision copy protection (as a factory bond-out option), and CGMS-A, APS, and ASD information as described in EN300-294 and IEC61880.

Housed in a TFBGA48 package with a 0.4 pitch and a footprint of only 4 x 4 mm, the SAA8510 is the smallest solution of its kind on the market. Moreover, the package is "dark green", meaning it's halogen-free and complies with the RoHS directive.

The SAA8510 in a system configuration



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