GM5766

Dual input LCD controller for UXGA/WSXGA+ applications

Features

- Programmable zoom and shrink scaling
- Triple-channel (8-bit) ADC (205 MHz) and PLL
- Ultra-Reliable DVI® receiver (165 MHz)—DVI 1.0-compliant
- ITU656 video input port with VCR trick mode support
- Advanced Active Color Management (ACM-3D) achieving six-axis color controls
- Adaptive Contrast and Color (ACC)
- Dual channel LVDS/RSDS transmitter
- Intel x86 compatible microcontroller with external SPI ROM interface
- Versatile OSD engine meets PC OEM specs
- All system clocks synthesized from a single external crystal
- Digital color controls and sRGB compliant
- 10-bit panel gamma correction and high quality dithering for 8-bit and 6-bit panel interface
- DDC controller for host interface purposes
- Low bandwidth ADC for keypad interface and cable detection
- Four PWM signals for backlight, audio volume control
- Internal test pattern generator for factory test purposes
- Energy Spectrum Management® (ESM®)

Application

- Low cost UXGA/WSXGA+ LCD monitors
- Low end MFM and TV
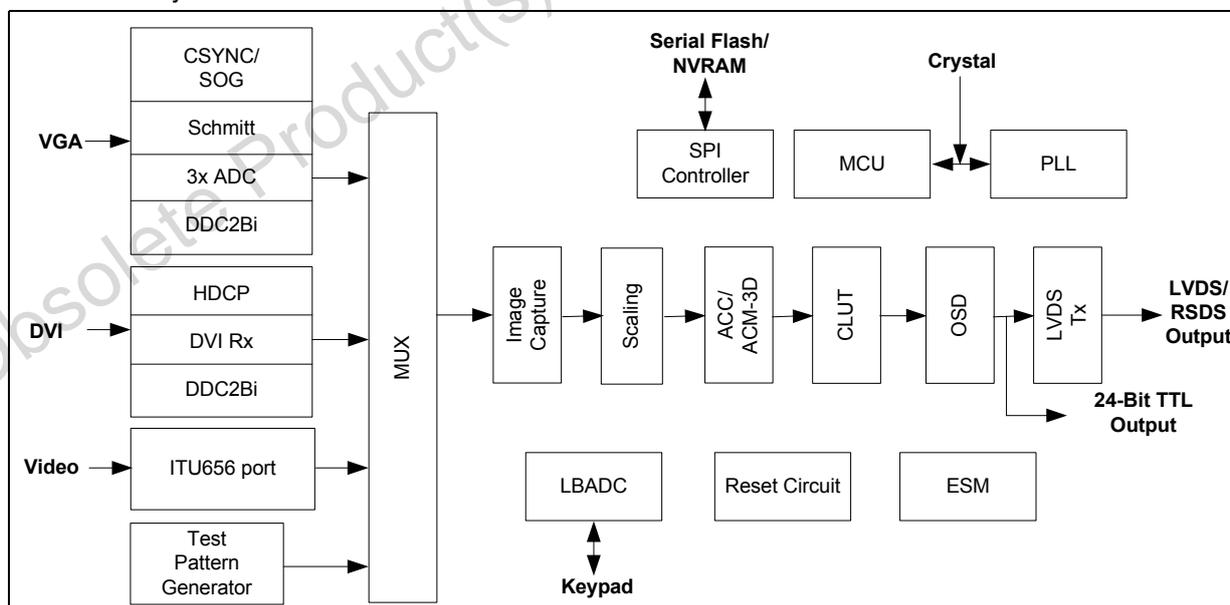
Note: ITU656 video input port is available only with LVDS and TTL panel interface and is not available for RSDS application.

1 Description

The GM5766 is an all-in-one LCD monitor controller with analog (RGB), DVI and video inputs, supporting resolutions up to UXGA/WSXGA+ in a very low pin count package. The GM5766 leverages advanced image-processing technology. As well, it has an integrated ADC/PLL and an Ultra-Reliable DVI compliant digital receiver to deliver a high-quality solution for mainstream dual-input monitors. The GM5766 also includes an ITU656 video input port with color space converter that makes it an attractive solution for low cost MFM and TV applications. The output section contains a 24-bit TTL output interface and a dual channel LVDS/RSDS transmitter for direct interfacing of commercially available LVDS and RSDS LCD panel modules.

In addition, the GM5766 includes an integrated x86 OCM with SPI compatible interface, advanced color control features, a multicolor proportional font OSD engine, and a number of system I/O components. Along with the high quality and reliability, the GM5766 also provides a very low cost system design by reducing the number of system components and the capability of deploying on a small size two layer PCB.

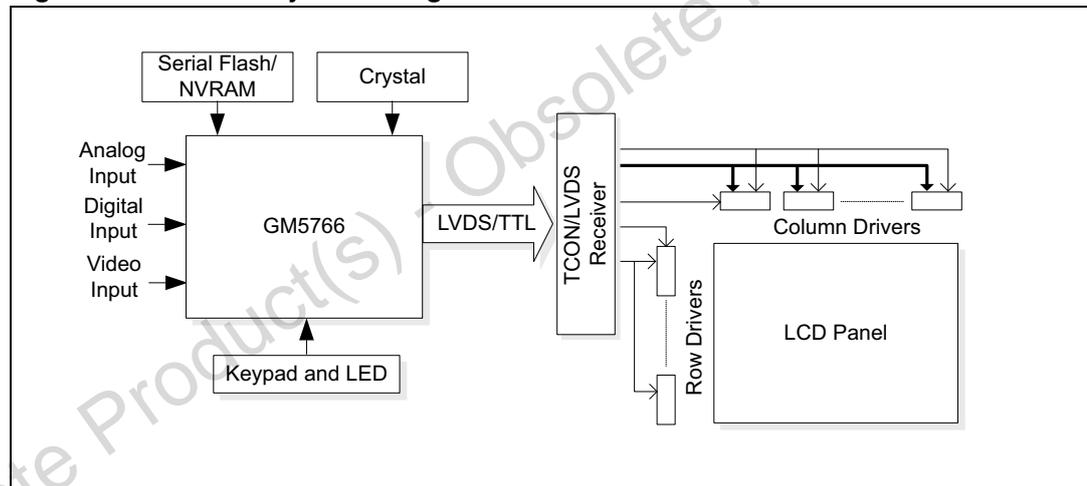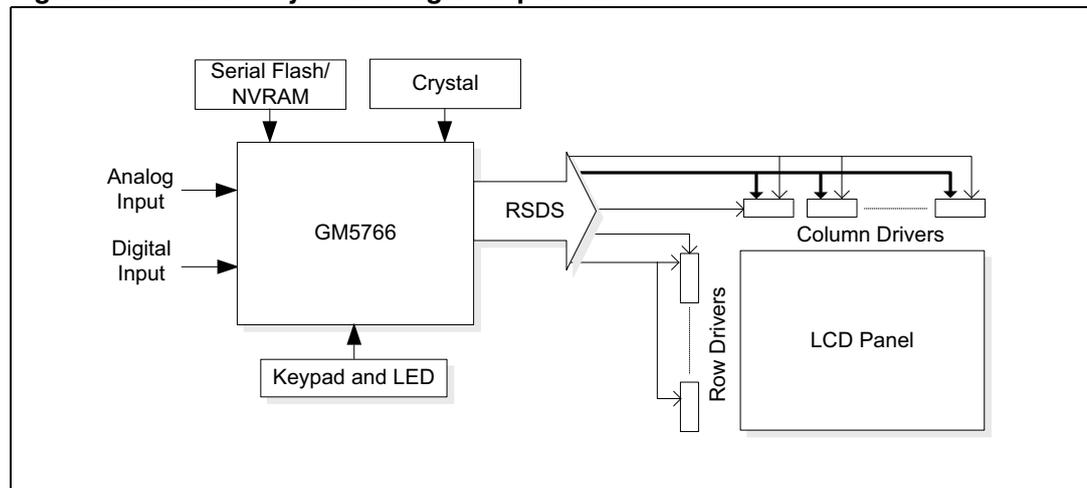**Figure 1.	GM5766 system design: conventional interface**

**Figure 2.	GM5766 system design: on-panel interface**

2　Feature attributes

- Intelligent Image Processing™
    - Programmable coefficients for user sharpness control
    - Real Recovery™ function provides full color recovery image for refresh rates higher than those supported by the panel
- Analog RGB input
    - Supports analog signal frequency up to 205 MHz
    - Composite-sync and Sync-on-Green (SOG) support
    - Input format detection and auto-alignment
    - Instant Auto™ for automatic phase and clock adjustment
- On-chip microcontroller
    - High-performance x86 MCU with on-chip RAM and ROM
    - Unified memory architecture simplifies chip programming
    - UART link for ISP and factory setting purposes
    - Two DDC2Bi with DMA buffer to internal RAM
    - Lower clock speed for low power mode (50mW)
    - JTAG support for firmware debugging
- Highly integrated system-on-a-chip
    - 5-volt tolerant inputs
    - Two layer PCB support
    - On-chip reset circuit to eliminate external reset IC
    - Integrated Schmitt trigger for HSYNC and VSYNC
    - General-purpose Input-Outputs and low bandwidth ADC inputs for IO system interface
- Ultra-reliable DVI input
    - Operating speed 165 MHz (up to UXGA 60 Hz)
    - Direct connect to all DVI-compliant digital transmitters
    - High-bandwidth Digital Content Protection (HDCP)
- On-chip OSD controller
    - On-chip RAM for high-quality programmable menus
    - 1, 2 and 4-bit per pixel character cells with proportional fonts
    - Horizontal and vertical stretch of OSD menus
    - Blinking, transparency and blending
    - Supports two independent OSD menus
- LVDS/RSDS transmitters
    - Double pixel up to UXGA/WSXGA+ 75 Hz output
    - Support for 8/6-bit LVDS panels and 6-bit RSDS panels (with high-quality dithering)
    - Pin swap, odd / even swap and red / blue group swap of RGB outputs for flexibility in board layout

– Energy Spectrum Management and programmable signal amplitude for EMI reduction purpose

● Advanced color controls

– TV style color controls including hue and saturation

– Advanced Active Color Management (ACM-3D) provides six-axis color controls, flesh-tone adjustment, gray guarding and image enhancement

– Multiple-bin ACC extends the dynamic range of the display

3   Ordering information

Table 1.   Order codes

Part number	Description
GM5766-LF-AA	128-pin PQFP
GM5766-LF-AA3	128-pin PQFP
GM5766-LF-AB	128-pin PQFP
GM5766-LF-AC	128-pin PQFP
GM5766H-LF-AB	128-pin PQFP
GM5766H-LF-AC	128-pin PQFP

In order to meet environmental requirements, ST offers these devices in ECOPACK®
packages. These packages have a lead-free second level interconnect. The category of
second level interconnect is marked on the package and on the inner box label, in
compliance with JEDEC Standard JESD97. The maximum ratings related to soldering
conditions are also marked on the inner box label. ECOPACK is an ST trademark.
ECOPACK specifications are available at *www.st.com*.

4   Revision history

Table 2.   Document revision history

Date	Revision	Changes
24-Sep-2008	1	Initial release.

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