



# GM5621, GM5626, GM2621

## Dual input LCD controller for entry level applications

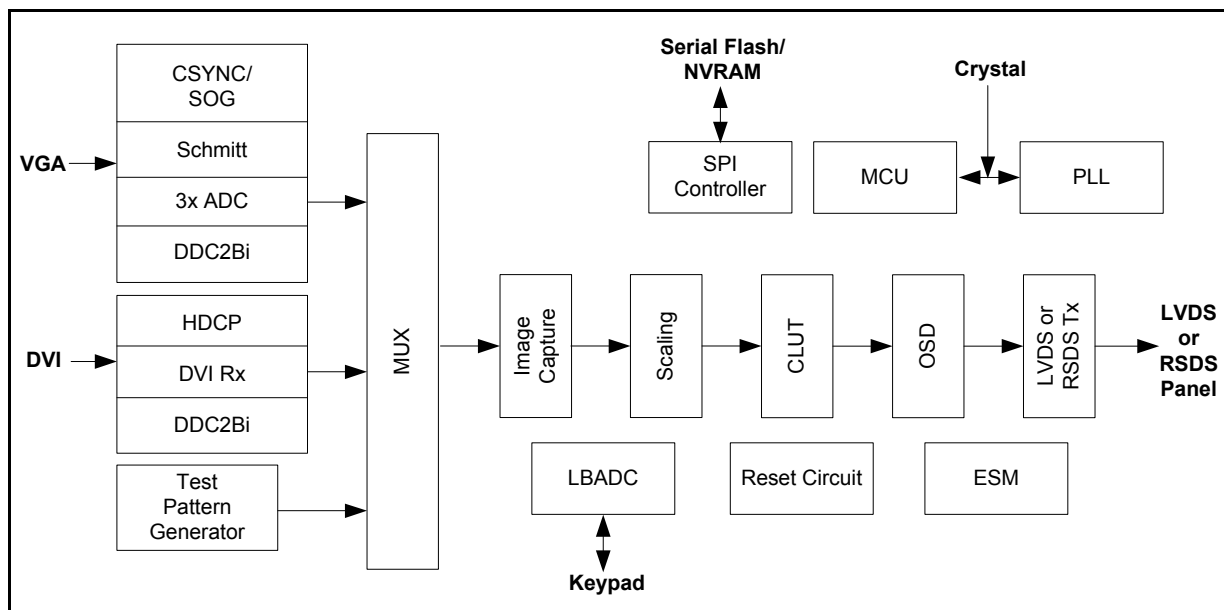
Data Brief

### Features

- Zoom (from VGA) and shrink (from UXGA) scaling
- Triple-channel (8-bit) ADC and PLL
- Ultra-Reliable DVI® receiver (165 MHz)—DVI 1.0-compliant
- Dual channel RSDS transmitter and TCON (GM5626 only)
- Dual channel LVDS 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
- Two Pulse Width Modulation (PWM) signals for backlight and volume control
- Internal test pattern generator for factory test purposes
- Energy Spectrum Management® (ESM®)
- Instant Auto™ Image Adjustment

### Application

- Mainstream analog and dual-input XGA/SXGA/WXGA LCD monitors



# 1 Description

Genesis GM5621 and GM5626 are all-in-one dual input LCD monitor controllers supporting resolutions up to SXGA/WXGA, available in a very low pin count package. GM5621/5626 leverage Genesis patented advanced image-processing technology, as well as a proven integrated ADC/PLL and an Ultra-Reliable DVI compliant digital receiver to deliver a high-quality solution for mainstream analog and dual input monitors. GM5621/5626 offer new Instant Auto technology, which provides fast and accurate image alignment for both static and moving images of the analog input signal. GM5621 includes an on-chip, industry standard, dual channel LVDS transmitter and a TCON, and GM5626 includes a dual channel RSDS transmitter for direct interfacing of commercially available LVDS/RSDS LCD panel modules.

In addition, GM5621/5626 include an integrated x86 OCM with SPI compatible interface, a multicolor proportional font OSD engine, a programmable coefficient scaling engine, dual channel Schmitt and Reset circuitry. Along with high quality and reliability, GM5621/5626 also provide a very low cost system design by reducing the number of components and the reduction in the board size.

GM2621 is a pin-compatible analog derivative product with integrated ADC/PLL, but no DVI receiver.

Figure 1. GM5621 system design: conventional interface

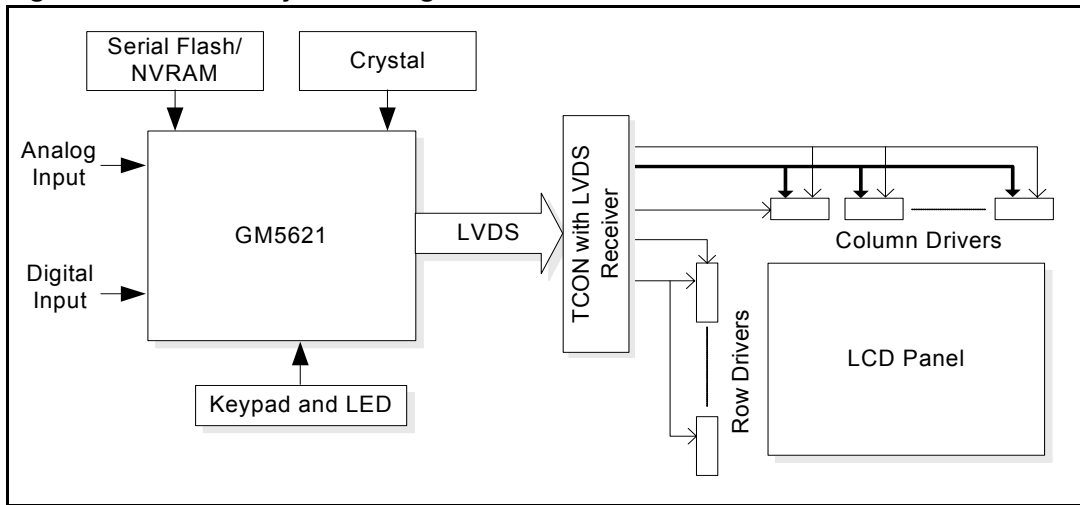
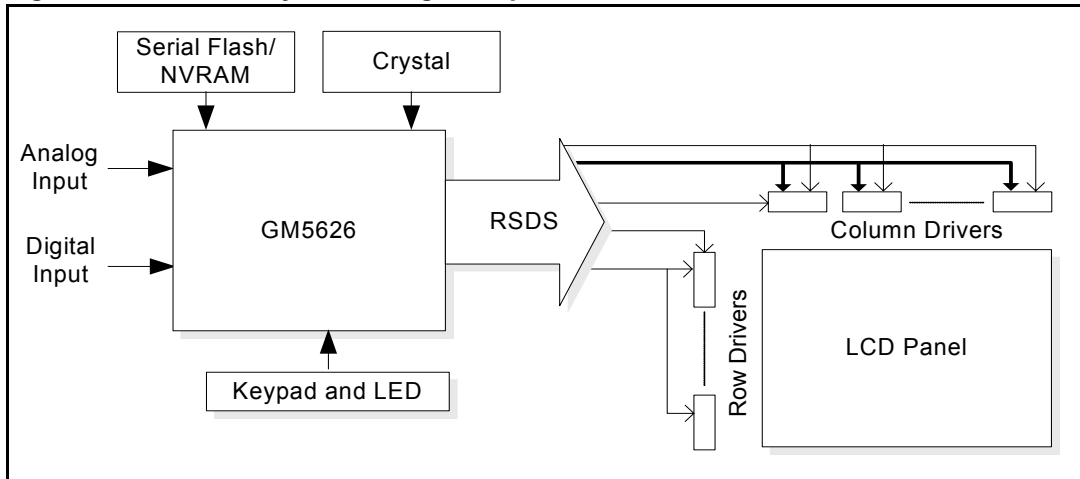


Figure 2. GM5626 system design: on-panel interface



## 2 Feature attributes

- Analog RGB input
  - Supports up to SXGA/WXGA 75 Hz/UXGA 60 Hz
  - Composite-sync and Sync-on-Green (SOG) support
  - Input format detection and auto-alignment
  - Phase clock and image positioning
- Instant Auto image adjustment
  - Faster and more accurate than current conventional methods
  - Auto-adjusts full width and partial width images
  - Auto-adjusts DOS screens and moving images, such as screen savers and motion pictures
- Ultra-reliable DVI input (GM5621/5626)
  - Operating speed 165 MHz (up to UXGA 60 Hz)
  - Direct connect to all DVI-compliant digital transmitters
  - High-bandwidth Digital Content Protection (HDCP)
- 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 LCD panel
- On-chip microcontroller
  - High-performance x86 MCU with on-chip RAM and ROM
  - Unified memory architecture simplifies chip programming
  - Five general-purpose outputs (GPO)
  - UART link for ISP and factory setting purpose
  - Two DDC2Bi with DMA buffer to internal RAM
  - Slow clock mode for 50mW sleep mode power consumption
  - JTAG support for firmware debugging
- On-chip OSD controller
  - On-chip RAM for high-quality programmable menus
  - 1, 2, and 4-bit per pixel character cells
  - Horizontal and vertical stretch of OSD menus
  - Blinking, transparency and blending
  - Supports two independent OSD menu rectangles
  - Proportional fonts
- LVDS transmitters
  - Double pixel up to SXGA/WXGA 75 Hz output
  - Support for 8/6-bit panels (with high-quality dithering)
  - Pin swap, odd or even swap and red or blue group swap of RGB outputs for flexibility in board layout
  - Programmable signal amplitude

- RSDS transmitters and TCON (GM5626)
  - Dual channel 6-bit RSDS compliant serial interface with direct connect to RSDS compliant column drivers
  - Support for type 1, type 2, and type 3 bus configuration
  - Pin swap, odd or even swap and red or blue group swap of RGB outputs for flexibility in board layout
  - Low EMI and power save feature include frame, line and in-line inversion and blanking
- Highly integrated system-on-a-chip
  - 50mW power saving mode
  - 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 low bandwidth ADC

### 3 Ordering information

**Table 1. Order codes**

Part number	Description
GM2621-LF-AA	128-pin PQFP
GM2621-LF-BC	128-pin PQFP
GM2621-LF-CD	128-pin PQFP
GM5621-LF-AA	128-pin PQFP
GM5621-LF-CD	128-pin PQFP
GM5626-LF-AA	128-pin PQFP
GM5626H-LF-AA	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](http://www.st.com).

## 4 Revision history

**Table 2. Document revision history**

Date	Revision	Changes
09-Oct-2008	1	Initial release.

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