GENESIS MICROCHIP

Preliminary Product Brief gm3125

Digital-Interface OnPanel SXGA LCD Controller

The gm3125 device is an all-in-one image processor targeted on the "Smart" LCD panel market with resolutions up to SXGA (1280x1024). The gm3125 leverages Genesis patented advanced image-processing technology as well a Genesis proprietary Ultra-Reliable DVI-compliant digital receiver to provide excellent image quality in simple and cost-effective solutions. The integrated OnPanel timing controller (TCON) is fully programmable to interface to a wide range of commercially available LCD panels. In addition, an integrated microcontroller is provided. This high level of integration reduces the number of components by eliminating the need for an LCD controller PCB and its associated connectors and cables. This reduces system cost, improves reliability and simplifies monitor design.
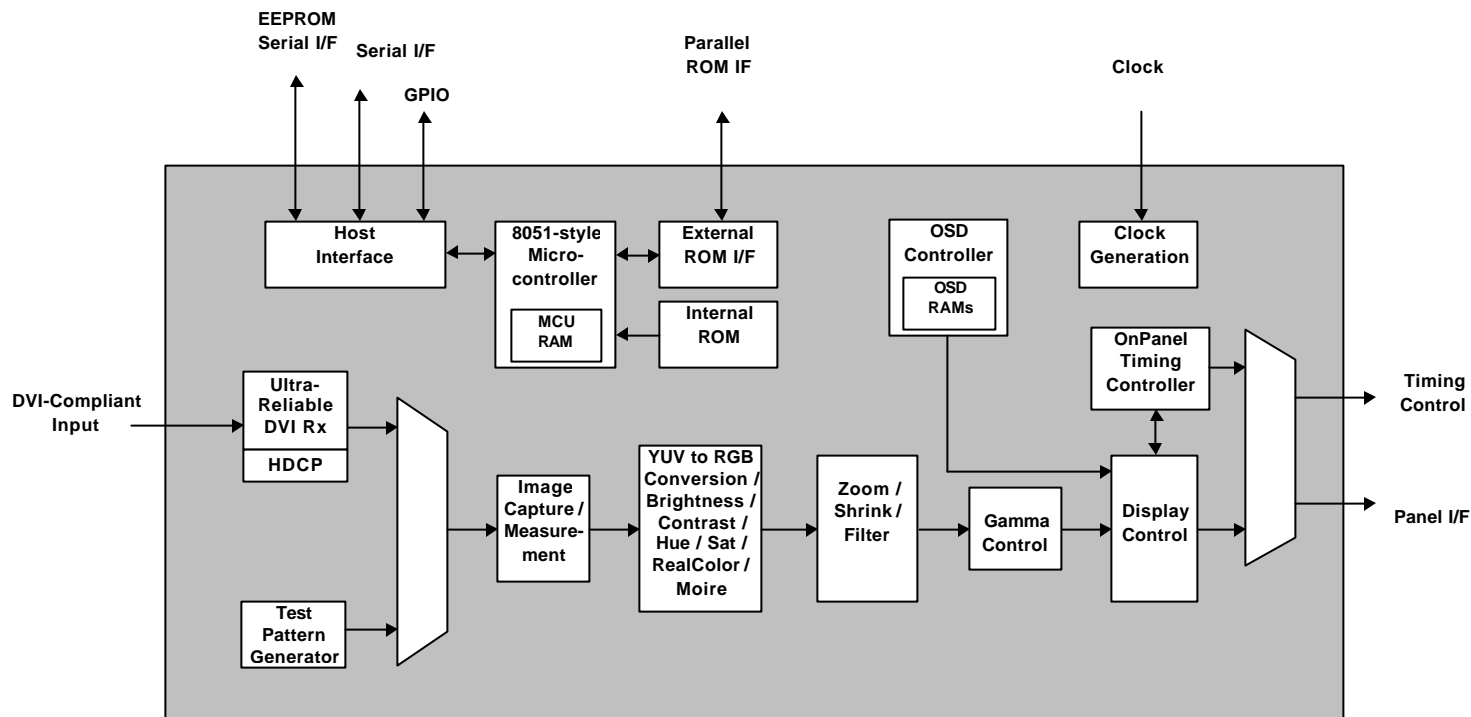
FEATURES

- Zoom (from VGA) and shrink (from UXGA) scaling
- Integrated Ultra-Reliable DVI 1.0-compliant receiver
- High-Bandwidth Digital Content Protection (HDCP)
- On-chip programmable OnPanel timing controller
- Embedded microcontroller with parallel ROM interface
- On-chip versatile OSD engine
- All system clocks synthesized from a single external crystal
- Programmable gamma correction (CLUT)
- RealColor controls provide sRGB compliance
- PWM back light intensity control
- 5-Volt tolerant inputs
- Low EMI and power saving features

- **High-Quality Advanced Scaling**
  - Fully programmable zoom ratios
  - High-quality shrink capability from UXGA resolution
  - RealRecovery function provides full color recovery image for refresh rates higher than those supported by the LCD panel
  - Moire cancellation

- **Ultra-Reliable DVI Compliant Input Port**
  - Operating up to 165 MHz (up to UXGA 60Hz)
  - Direct connect to all DVI-compliant digital transmitters
  - High-bandwidth Digital Content Protection (HDCP)

- **RealColor Technology**
  - Digital brightness and contrast controls
  - TV color controls including hue and saturation controls
  - Flesh-tone adjustment
  - Full color matrix allows end users to experience the same colors as viewed on CRTs and other displays (e.g. sRGB compliance)

- **On-chip OSD Controller**
  - On-chip RAM for downloadable menus
  - 1, 2 and 4-bit per pixel character cells
  - Horizontal and vertical stretch of OSD menus
  - Blinking, transparency and blending

- **On-chip Microcontroller**
  - Requires no external microcontroller
  - External parallel ROM interface allows firmware customization with little additional cost
  - 21 general-purpose inputs/outputs (GPIOs) available for managing system devices (keypad, back light, NVRAM, etc)
  - Industry-standard firmware embedded on-chip, requires no external ROM (configuration settings stored in NVRAM)

- **Built-in OnPanel Timing Controller**
  - Eliminates the need for an external timing controller (TCON) device, thereby reducing system cost
  - Direct connect to commercial row/column driver ICs (supports dual-bus / dual-port and dual-bus / single-port)
  - Low EMI and power saving features include frame, line and in-line inversion, blanking, data staggering, slew rate control

- **Output Format**
  - Single / double wide up to SXGA 75Hz output
  - Pin swap, odd / even swap and red / blue group swap of RGB outputs for flexibility in board layout
  - Support for 8 or 6-bit panels (with high-quality dithering)

- **Highly Integrated System-on-a-Chip Reduces Component Count for *Highly Cost Effective Solution***

- ***Stand-alone* operation requires No external ROM and No firmware development for *Fast Time to Market***

- **Pin and register-compatible *OnPanel Family*:**
  - gm5115/gm5125 Dual-Interface XGA/SXGA
  - gm3115/gm3125 Digital-Interface XGA/SXGA
  - gm2115/gm2125 Analog-Interface XGA/SXGA

PACKAGE

- 208-pin PQFP

gm3125 Functional Block Diagram

gm3125 OnPanel Design Example

Note: RealColor, Real Recovery and Ultra-Reliable DVI are trademarks of Genesis Microchip Inc.