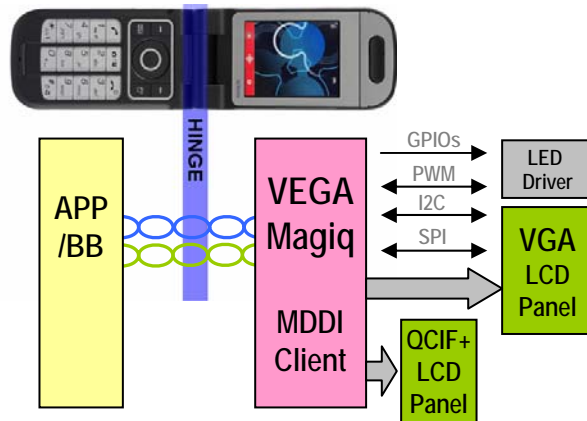


LCD Controller for VGA Panels

Overview

VEGAMagiq (TC358720XBG)

VEGAMagiq is Toshiba's MDDI (Mobile Display Digital Interface) LCD controller, optimized for mobile phones equipped with a high resolution LCD panel. Since the mobile industry trend is going to high-resolution and wide colour range displays in high-end clam-shell style phones, connections between base body and the display subsystem becomes more and more complex. VEGAMagiq has a high-speed serial digital packet host interface that is compliant with VESA MDDI standard. This serial data interface supports throughputs of up-to 400Mbps by using two low-voltage differential signal pairs. It is compatible to systems that are using Qualcomm's MSM™ baseband family. Due to the combination of LVDS technology with on-chip eDRAM memory buffer, VEGAMagiq supports VGA size main LCD panel and QCIF+ size sub LCD panel with low EMI emission and high reliability through the handset's hinge.



Application / Benefits

- **High resolution display support**
 - Main display support up to VGA size, 60Hz refresh rate
 - Sub display support up to QCIF+ size
- **Magic Square™ algorithm**
 - By using Magic Square algorithm, RGB666 can be interpolated to pseudo RGB888 image data with up to 16 million colours
- **High speed serial data link**
 - Throughput up-to 400Mbps
- **Reduce signal wires through the hinge**
 - Only two pairs of low-voltage differential signal for data transmission
- **Additional GPIOs at the upper clamshell chassis**
 - I/O expansion for baseband processors
- **PWM signals for LED control**
 - Two PWM signals for LED intensity control for main and sub display

Product Features

- **Embedded DRAM**
 - 8Mbit embedded DRAM
 - Primary frame buffer: *VGA*
 - Secondary frame buffer: *QCIF+*
- **Host Interface**
 - MDDI Type 1 client interface with data rates up to 400 Mbps
- **Display Interface**
 - Support for 2 panels
 - Maximum LCD size is *VGA*
 - Output format *RGB565/RGB666*
 - 16/18-bit RGB interface and 8/16/18-bit MPU bus interface
 - Programmable gamma correction and RGB format conversion
 - Support for rotation and mirroring
- **Peripheral Interface**
 - SPI Interface
 - I2C Interface
 - Up to 10 GPIO ports
 - Two PWM signals for LED intensity control
- **VSYNC Alignment**
 - MDDI Client wakeup mechanism is used for synchronization with refreshing timing of either primary or secondary LCD panel.
 - Wakeup timing is programmable
- **System Clock**
 - DPLL with 32kHz clock input generates system clocks for displaying main LCD even if MDDI interface is stopped.
 - DPLL can be stopped during shutdown-mode
 - DPLL operation is controlled through MDDI interface
- **Other functions**
 - MDDI Link -low power (hibernation support)
 - Partial display update (MediaPlayer support)
 - Magic Square™ algorithm
- **Voltage Supply**
 - Core 1.5V, DRAM 2.6V
 - IO 1.5V, 1.8V, 1.8-3.0V
- **Package**
 - 81pin 0.5 pitch 6mm x 6mm TFBGA

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