SiliconMotion

SM718
LynxSE+ Embedded Graphics Processor

The SM718 is a PCI 2D multimedia mobile display controller device, packaged in a 320-pin BGA. Designed to complement needs for the embedded industry, it provides video and 2D capability. To help reduce system costs, it supports a wide variety of I/O, including analog RGB and digital LCD Panel interfaces, two Zoom Video interfaces, and Pulse Width Modulation (PWM). There are additional GPIO bits that can be used to interface to external devices as well.

The 2D engine includes a front-end color space conversion with 4:1 and 1:8 scaling support. The video engine supports two different video outputs (Dual Monitor), at 8-bit, 16-bit, or 32-bit per pixel and a 3-color hardware cursor per video output. The LCD panel video pipe supports a back-end YUV color space conversion with 4:1 and 1:212 scaling. A Zoom Video (ZV) port is also included to interface to external circuitry for MPEG decode or TV input.
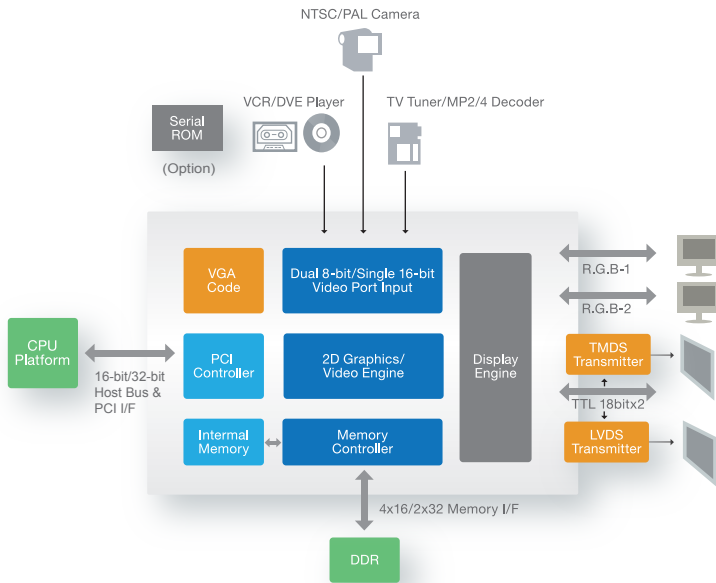
APPLICATIONS

- Thin Client
- Server
- IPC / POS / MFP / DVR
- Factory Automation (HMI)
- Medical Device

- Handheld / Portable Device
- Gaming Machine
- Test Instrument
- Digital Signage
- All Other Embedded Graphics Applications

FEATURES

- **16/32-bit Host Bus & PCI Architecture**
  - X86/PCI processors
  - ARM, MIPS, SuperH processors
- **16MB Integrated Video DDR Memory**
  - Embedded 16MB DDR only
  - External up to 64MB DDR (64-bit I/F)
- **Low Power Consumption < 1W**
- **Cost-Effective Multi-Display/Panel Supports**
  - Dual 300MHz DAC supports up to 1920x1440 resolution
  - Dual 18-bit DVO interface for TMDS or LVDS transmitter supports up to 1920x1440 resolution
  - Independent resolution and refresh rates for dual display types
- **Quick-Rotation Features**
  - Allow for 90°, 180°, and 270° rotation of on-screen images
- **Serial EEPROM Interface**

- **2D Graphic Accelerator**
  - 128-bit 2D graphic engine
  - ROP3's, BitBLT, transparent BLT, pattern BLT, color expansion, and line drawing
  - YUV-16/32-bit RGB conversion
- **Video Display Layers**
  - Support 7 layers of display frames (2 hardware cursors, primary graphic, video, video alpha, alpha, and secondary graphics)
- **Zoom Video Port**
  - Two 8-bit ports or one 16-bit video capture port supports ITU601 AND ITU 656 specifications UV-16/32-bit RGB conversion
- **DMA Controller**
- **GPIO/I2C/SSP Interface**

BLOCK DIAGRAM

NTSC/PAL Camera

VCR/DVE Player   TV Tuner/MP2/4 Decoder

Serial
ROM

(Option)

CPU
Platform

16-bit/32-bit
Host Bus &
PCI I/F

VGA
Code

Dual 8-bit/Single 16-bit
Video Port Input

PCI
Controller

2D Graphics/
Video Engine

Display
Engine

Internal
Memory

Memory
Controller

R.G.B-1

R.G.B-2

TMDS
Transmitter

TTL 18bitx2

LVDS
Transmitter

4x16/2x32 Memory I/F

DDR

SPECIFICATION

Graphics Engine	2D
Host Interface	16/32-bit Host Bus, PCI
Int. Memory	16MB DDR (option)
Ext. Memory	64MB DDR (max)
Resolution	1920 x 1440 (max)
Software Support	WinCE, WinXP, Win7, Win2003(32-bit/64-bit), Win2008(32-bit/64-bit), Linux Enterprise(32-bit/64-bit)
CPU Platform	Intel, AMD, ZFMicro, Freescale PPC, AMCC, STMicro, Marvell, Loongson and other PCI
Operation Temperature	C-Temp & I-Temp
Package	320-pin BGA MCM (19mm x 19mm)

Orion Multimedia Platform
Embedded Platform with S3C6410+SM718

Orion Embedded Multimedia System employs SM718 LynxSE+ GPU with Samsung S3C6410 ARM11 MCU and includes Linux or Windows embedded Operating System. It is designed to provide a cost-effective, low-power, high performance solution for mobile and embedded computing applications. Orion supports MPEG2, MPEG4, H.263, H.264 and VC1 hardware decode providing excellent media performance and power efficiency. Users can quickly and easily employ SMI GPU technology in their mobile and embedded products.

S3C6410 FEATURES

- ARM1176JZF-S Based CPU
- 533MHz @ 1.1V, 667MHz @ 1.2V
- 64 to 256 MB DDR System Memory
- 256MB NAND Flash
- I2S Audio Codec Interface
- USB 2.0 OTG, USB 1.1 Host
- UART
- Ethernet

SYSTEM FEATURES

- TV Composite and S-Video Outputs
- Stereo Audio Output
- SD/MMC Interface

SOFTWARE SUPPORT

- Windows Embedded Compact 7 and CE 6 R3
  - Office Apps
  - Internet browser
  - Media Player video & audio
  - Games (DirectDraw)
  - Dual view display up to 1920x1440
- Linux Version 2.6.x
  - Xserver 1.7.5, Blackbox, Xterm
  - NAND, SD, TFTP and NFS boot
  - X11 based applications
  - MPlayer video & audio decoder
  - Dual display: DVI, VGA
- Android Version 2.3
- Source Code, Sample, and Reference API Interface Provided

SiliconMotion

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