

# The Highest Integrated and Lowest BOM Cost Surveillance SOC for 4/8/16-Ch H.264 Hybrid DVR/NVR Solution

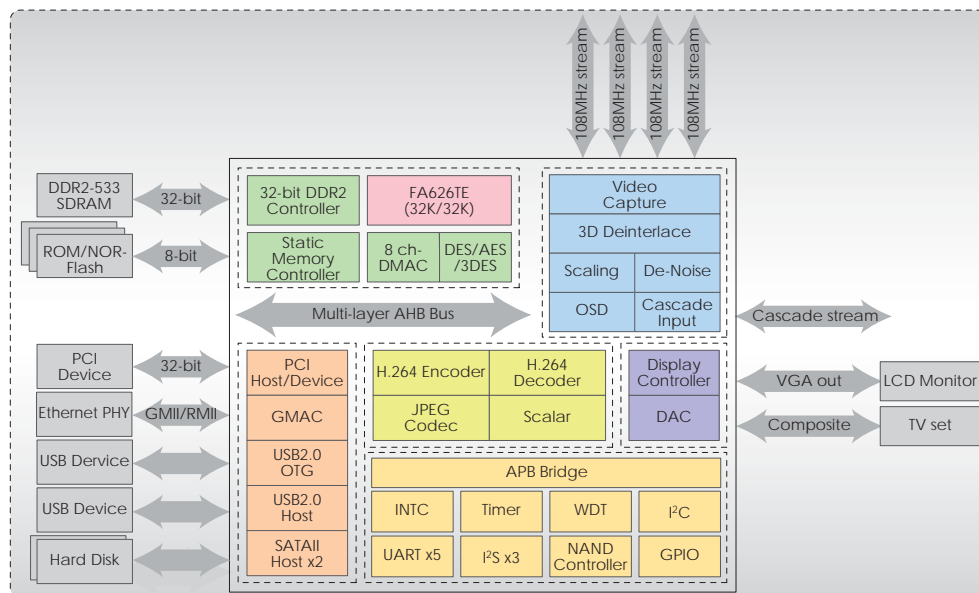
VIDEO SOLUTION

## Overview

Grain Media's GM8181 SoC solution has the maximum flexibility for hybrid DVR demanding and digital surveillance application. With up to 533Mhz embedded FA626TE ARM® V5 ISA compliant CPU, the GM8181 processor provides a leading performance to enable the value-added features of graphic user interface. With SATAII controller and PHY, VGA display controller, DDR2 controller, NAND boot design are integrated, GM8181 is the lowest BOM cost digital surveillance solution in industry. This SoC also integrates USB 2.0 Host /OTG controller, USB 2.0 PHY, H.264 codec, JPEG codec, TV encoder, PCI bridge, Gigabit Ethernet MAC controller, DES/3DES controller, DMA controller and AMBA bus framework. GM8181 supports 27/54/108MHz video input, de-noise and 3D de-interlacer to provide high quality video bit streams. Moreover, it's high performance H.264 video codec up to 75-D1 encoding and 60-D1 decoding capability for 4/8-CIF realtime DVR with single SoC solution. PCI boot, video cascade port are integrated for two-chip cascade solution, GM8181 is the cost-effective and easy development platform for high-end 16 CIF and 4-D1 realtime DVR products.



Figure 1: GM8181 SoC Block Diagram



## Application

- Digital video recorder (DVR)
- Digital video server (DVS)
- Hybrid DVR
- Network video recorder (NVR)
- Digital media adaptor
- Media gateway
- Network attached storage





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## Feature Lists

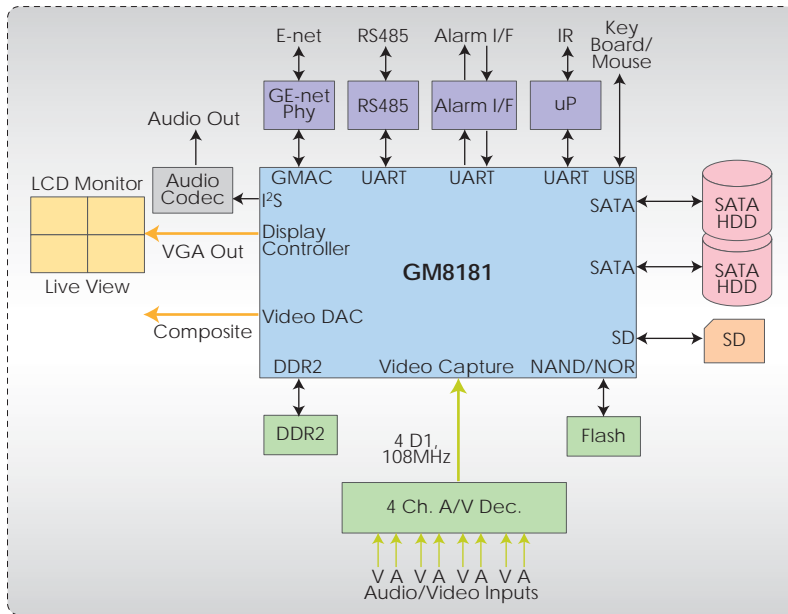
Embedded CPU	FA626TE, ARM® V5 ISA CPU, 533 MHz (Max)
Memory Interface	32-bit DDR2 533 SDRAM interface NOR Flash/NAND Flash interface for system booting
H.264 Codec	Supports the baseline profile encoding up to D1@75fps (max) Supports the baseline profile decoding up to D1@60fps (max)
JPEG Codec	JPEG is compliant with ISO/IEC 10918-1 baseline standard up to D1@60 fps
Video Capture	Support Four BT.656 input ports @108MHz The max resolution is 720x480 (NTSC) or 720x576 (PAL) Supports 54MHz/108MHz pixel/frame interleave mode Flexible design for video decoder and multiplexer interface Support size down Support 8 private region masks in each channel Support font-based OSD on recording channel Provide clock output to video decoder to save external oscillator (27, 54, 108MHz)
Display Interface	Supports 1080/60i, 720/60p, 480/60i, 576/60i resolution Integrate 27MHz DAC for composite output (NTSC/PAL) Integrate 150MHz DAC for VGA output Support font-based OSD for display outputs Support 3 graphic planes and hardware cursor
Security Engine	DES/Triple-DES encryption/decryption compliant with NIST standard AES 128/192/256-bit encryption/decryption compliant with NIST standard
Peripherals Interface	USB 2.0 OTG *1, USB 2.0 Host *1 SATAII Host *2 10/100/1000 Ethernet MAC PCI 2.2 Interface, IDE Interface SDIO/SDHC, GPIO x 4, I <sup>2</sup> C, I2S x 3, UART x 5
Operating Voltage	1.2 V (core), 1.8 V (DDR2 DRAM I/O) and 3.3 V (I/O)
Process	0.13 μm logic process
Package	684-pin PBGA



## GM8181 System Solutions

GM8181 is the select solution for 4/8/16-Ch CIF@240fps or 4/8/16-Ch D1@60 fps DVR/DVS system. The system solution and application are illustrated as following.

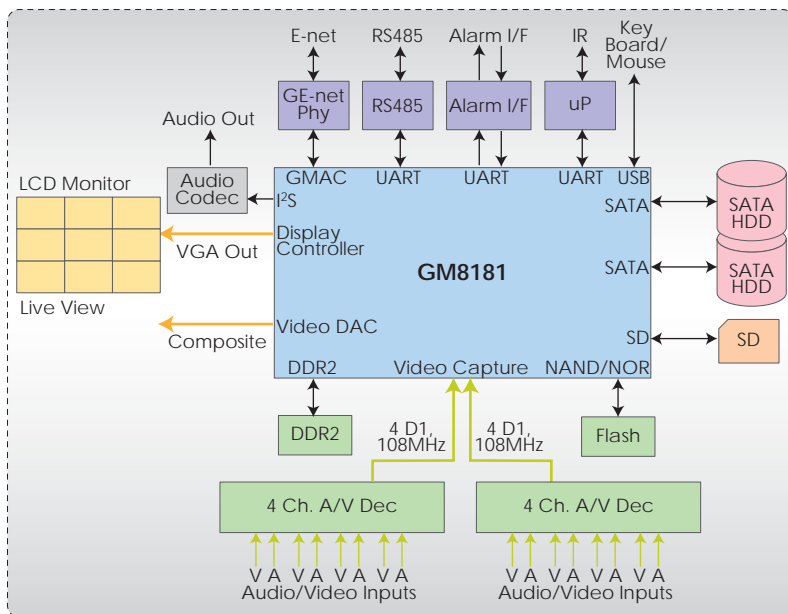
### 4 Ch DVR/DVS – 4 CIF 120fps (Real Time)



### System Performance

- 8CIF ENC + 8CIF DEC + 8QCIF streaming + preview + display
- 2D1 ENC + 2D1 DEC + 2CIF streaming + preview + display

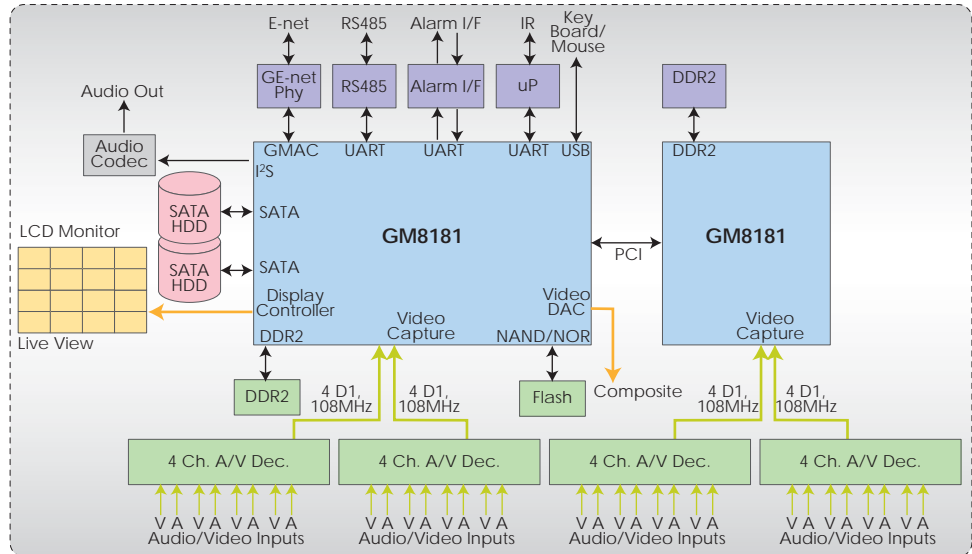
### 8 Ch DVR – 8 CIF 240fps (Real Time)



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## 16 Ch DVR – 16 CIF 480fps (Real Time)



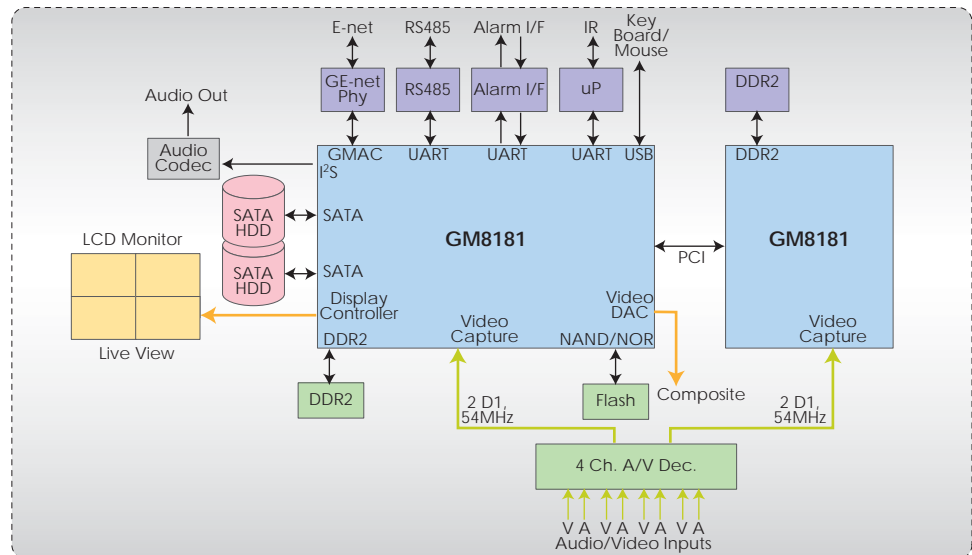
### Software Design Kit

- Linux Kernel 2.6.14
- H.264 Codec driver
- JPEG Codec driver
- Peripheral devices driver
- Protocol stacks
  - DNS, DDNS, DHCP, HTTP, PPPoE, SMTP, FTP, TFTP, NTP, NFS client servers

### Tool Chain

- arm-elf-gcc 3.4.4: GNU C compiler for the embedded Linux
- glibc 2.3.5: GNU C library for the embedded Linux
- binutil 2.15.97: GNU binary image builder utility
- Support 1-/4-/9-/16-channel

## 4 Ch DVR – 4 D1 120fps (Real Time)



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Flyer version no. GM-2009-04