

Grain Media® GM8185

H.264/MPEG-4/JPEG SoC Solution Targeting Digital Surveillance,
4-/8-/16-Channel D1 Real-Time DVR

VIDEO SOLUTION

Overview

The GM8185 is a highly integrated H.264/MPEG-4/JPEG SoC solution specifically targeting 4-/8-/16-channel D1 Real-Time DVR appliances. With the pure hardwired video codec architecture, the max. 500 MHz FA626 ARM-based CPU can be used for computing of audio encoding & decoding and also eases customers' effort to achieve product differentiation through video analytics, MicroWindow GUI support and efficient file management system. The GM8185, optimized solution for 4-/8-/16-channel DVR, consists of the CPU, cache controller, video codec engine, Gigabit Ethernet MAC, highly efficient DMA controller, system bus architecture and special DDR2 controller. The GM8185 SoC can meet requirements of high performance and bandwidth from multi-channel DVRs. The built-in advanced H.264 codec supports 4D1 120fps encoding and 2D1 60fps decoding simultaneously. H.264, the latest video codec algorithm, is supported as well, which 1/3 of bandwidth of MPEG-4 at the same video quality, and has been proven the best solution for intranet storage and internet streaming applications.

The GM8185, embedded with powerful CPU, advanced H.264/MJPEG/MPEG-4 codec, USB OTG, Gigabit Ethernet MAC, DDR2 controller, video capture and display controller, offers a best BOM cost for multi-channel DVRs. With the efficient cascade mode support, multiple chip master/slave architectures can reduce the system complexity of 8-/16-channel DVR applications. Moreover, the hardwired security functions including privacy regions, and digital signature are also supported in the GM8185 solution.

GM8185 Linux SDK and GM Streaming Media (GSM)

GM Linux SDK is comprised of five components: Linux kernel, peripheral drivers, network protocol stack, sample video application software and web server/CGI interface. The Linux SDK is based on the embedded Linux 2.6.14 OS to provide drivers of all peripherals including 802.3 Ethernet MAC, USB 2.0 OTG, ATA-133 IDE controller, SD/MMC, I²S, capture and CCIR 656 or LCD display controller. Video codec algorithms, including H.264/MPEG-4/JPEG, are also provided. The Linux SDK provides but does not limit to network protocol stack, PPPoE, DHCP, DDNS, SMTP and HTTP.



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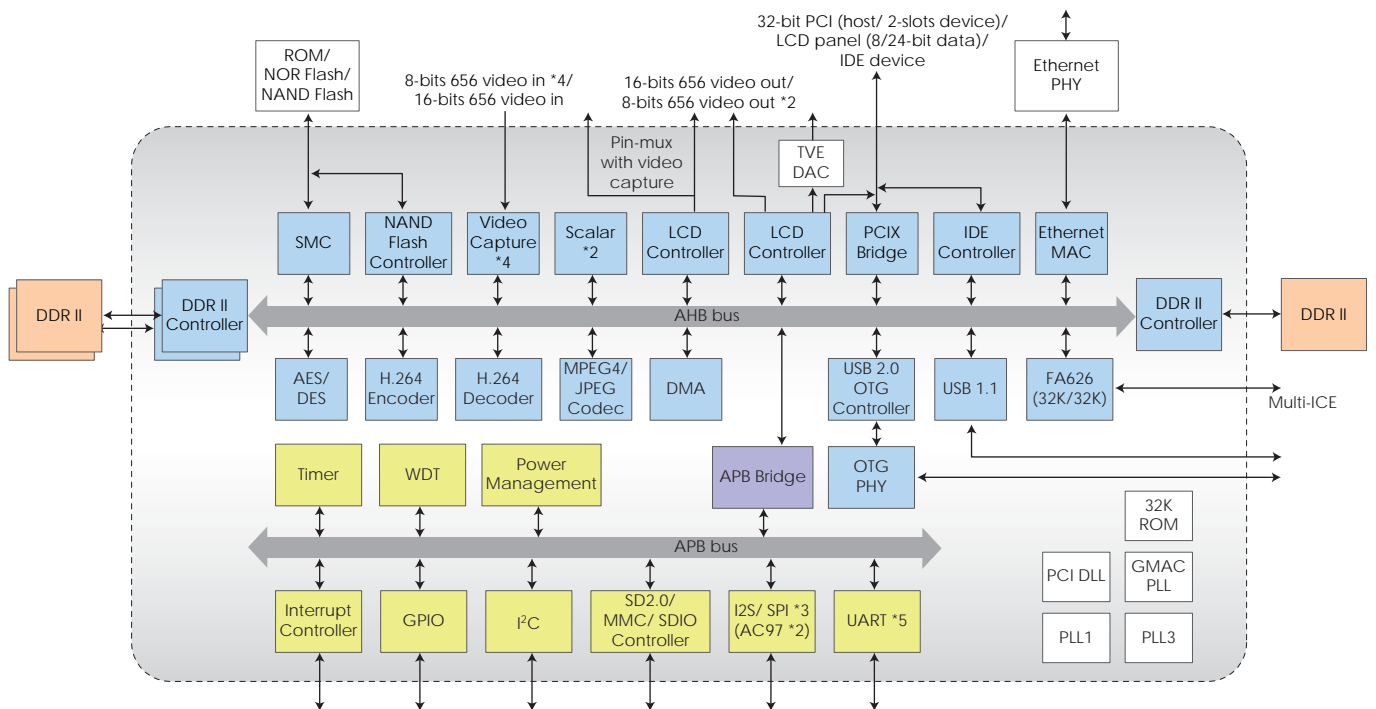
H.264/MPEG-4/JPEG SoC Solution Targeting Digital Surveillance,
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Linux SDK is not only a solution for dynamic IP address environment but also the solid foundation for easy installation.

Video applications include video decoder – ffmpeg, video encoder – ffmpeg. They are the ideal reference coding to shorten the development lead time. The Linux SDK also provides a simple web server and CGI control interface that allow users to manage the related configurations.

GM Streaming Media (GSM) is an IP camera/IPTV station application software package, which integrates the video/audio codec algorithm and network streaming protocols with low latency tuning and dynamic bit rate control to adapt to the dynamic internet traffic. The GSM has two components: GSM server and the GSM client player including GMPlayer and GMSurviewer. GSM server is a full functional video/audio streaming server that runs in a Linux environment and supports the GM8180 video compression engine. It includes streaming server, encoder, control server and web server. The GMPlayer program is DirectShow-based application developed for streaming video player and streaming server control. GMSurviewer is a software reference application that supports the basic functions to connect to the 1-/4-/9-/16-channel GSM server. RTSP, RTP over TCP/UDP, are supported for streaming players like QuickTime, and RealPlayer, etc. GSM also supports 3GPP for mobile phones. Combined with GSM and GM Linux SDK, it is a turnkey software solution with the UI interface for customers to differentiate their products.

Block Diagram



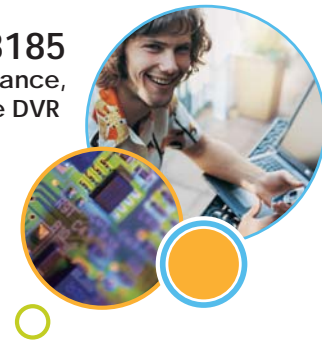


CPU	FA626 ARM-architecture CPU, up to 500 MHz, 32K I-cache/32K D-cache
Memory Interface	- 16-bit DDRII-400 SDRAM interface x3 - 8-bit shared asynchronous SRAM / ROM / Flash interface - NAND Flash interface with boot feature
H.264 Codec	- Support the baseline profile encoding up to half duplex D1 @ 120 fps. The resolution is up to 1920x1280 @ 20 fps stepped in the units of 16 - Support the baseline profile decoding up to half duplex D1 @ 60 fps. The resolution is up to 1920x1280 @ 10 fps stepped in the units of 16 - Support the baseline profile full duplex D1 @ 60 fps. The resolution is up to 1920x1280 @ 10 fps stepped in the units of 16
MPEG-4/JPEG Codec	- MPEG-4 supporting Simple Profile level 0 ~ 3, encoder up to D1, 60 fps and decoder up to D1, 60 fps - JPEG is compliant with ISO/IEC 10918-1 baseline standard.
Video Capture	- Support Video capture x 4 (BT1120x1 + BT656x1 / BT656x4) - Resolution: Up to 1280 x 1024 - Support noise reduction, color OSD and input scalar - LCD controller x 2 (HDx1 + D1x1)
Display Interface	- Support the TFT color display with up to 24-bit bus interfaces - Resolution programmable up to 1920x1080 - Pixel clock rate up to 120MHz
PCI Interface	- Compliant with PCI 2.2, up to 66 MHz* - Support 2-slot PCI masters in the PCI host/device modes
AES/DES/3DES Cipher Controller	Hardware implementation of AES/DES/3DES algorithm with DMA functions
AHB Peripherals	802.3 MAC, USB2.0 OTG, ATA-133 IDE
APB Peripherals	SD 1.0/MMC 4.0 controller, timer, WDT, RTC, INTC, GPIO (16-pin), I ² C, PMU, I ² S, UART
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	700-pin PBGA (35 x 35 mm ²)

*Supports on-board trace

GM8185 Linux SDK

- **ARM Linux 2.6.14**
- **Peripheral device drivers**
- **Protocol stacks**
 - DNS, DDNS, DHCP, HTTP, PPPoE, SMTP, FTP, TFTP, NTP, NFS client servers
- **Video streaming applications**
 - Video decoder - ffmpeg Video encoder - ffmpeg Web server
 - GM Linux SDK provides an easy development software package to accelerate image-, video- and audio-related streaming applications, such as video servers, IP cams and IPTV stations.



GM Streaming Media (GSM)

- **GSM Server (Streaming Server, Control Server and Web Server)**
 - Support RTSP, RTP and 3GP
 - Support H.264/MPEG-4/JPEG/ADPCM/MP2/AMR-NB audio compression formats up to quarter streaming
- **GSM Client Player (GMPlayer and GMSurviewer)**
 - Support RTSP, RTP and 3GP
 - Support H.264/MPEG-4/JPEG/ADPCM/MP2/AMR-NB audio compression formats
 - Support 1-/4-/9-/16-channel viewer (reference design)

GM8185 Starter Kit

- 4-Ch DVR [4D1 120fps]
- 16-Ch DVR [16CIF 480fps]
- 16-Ch DVR [16D1 480fps]

Platform Evaluation Kit

- **Basic Parts**
 - GM8185 main board for DVR applications
 - RS-232 cable for debugging console
 - Power supply adapter
 - GM8180 Linux SDK including drivers and BSP
- **Extension Parts**
 - OPENice (Provided by Aiji) LCD module

Availability & Pricing

- GM8185 EVB is available, priced at US\$ 7,000.
- GM8185 is manufactured in UMC's 0.13 μm process for mass production.



Grain Media, Inc.
www.grain-media.com

- HEADQUARTERS, TAIWAN
Hsinchu, Taiwan
Tel: +886.3.564.5533
tw-sales@grain-media.com
- CHINA OFFICE
Shenzhen, China
Tel: +86.755.8839.2187
cn-sales@grain-media.com

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