Hi3516 Full-HD IP Camera SoC

Key Specifications

Processor
ARM Cortex A9
- Up to 800 MHz
- 32 KB L1 I-cache, 32 KB L1 D-cache
- 256 KB L2 cache

Video Encoding
H.264 baseline profile
H.264 main profile
H.264 high profile
MPEG4 SP
MJPEG/JPEG baseline

Video Encoding Performance
16-megapixel maximum resolution for H.264 encoding
Real-time H.264&JPEG encoding of multiple types of streams:
- 1080p@30 fps+D1@30 fps+CIF@30 fps+QVGA@30 fps+1080p JPEG snapshot 1 fps
- 720p@60 fps+D1@30 fps+CIF@30 fps+QVGA@30 fps+720p JPEG snapshot 1 fps

JPEG snapshot of 3-megapixel@15 fps to 16-megapixel @2 fps
MPEG4 SP encoding, a maximum of 960H resolution
CBR, VBR, and ABR, ranging from 16 kbit/s to 40 Mbit/s
Encoding frame rate, ranging from 1/16 frame/s to 60 frame/s
ROI
Color-to-gray

Intelligent Video Analysis
Integrated intelligent analysis acceleration engine, supporting motion detection, boundary guard, face detection, and video diagnosis

Video and Graphic Processing
De-interlace pre-processing, image enhancement, edge enhancement, and 3D denoise
Anti-flicker processing for output videos and graphics
1/16x to 8x video scaling
1/24x to 42x image scaling
OSD overlay pre-processing for eight areas during encoding
Hardware graphics overlay post-processing for the videos at two layers (video layer and graphics layer 1)

ISP
Adjustable 3A function
WDR, highlight compensation, backlight compensation, gamma correction, and color enhancement
Defect pixel correction, denoise, and digital image stabilizer
ISP APIs for adjusting the ISP effect
PC sensor and ISP tuning tools

Audio Codec
Voice codec in compliance with multiple protocols by using software
G.711, ADPCM, and G.726 encoding
Echo cancellation

Security Engine
AES, DES, and 3DES encryption and decryption algorithms by using hardware
Digital watermark

Video Interfaces
Input
- 8-/10-/12-/14-/16-bit RGB Bayer input, a maximum of 150 MHz clock frequency
- BT.601
- BT.656
- BT.1120, supporting the embedded synchronization and external synchronization modes
- Compatibility with mainstream CMOSs provided by SONY, Aptina, OV, and Altasens
- Compatibility with HD CCDs provided by Sharp and Panasonic
- Compatibility with the 960H CCD sensor
- Video inputs of 16-megapixel@2 fps, 5-megapixel@5 fps, 3-megapixel@15 fps, 1080p@30 fps or 720p@60 fps
- Two input interfaces. Only one has the ISP function, and dual-sensor inputs are supported.

Output
- 1-channel CVBS output and one BT.656 output interface
- One BT.1120 VO interface for connecting to the external HDMI or SDI interface, 1080p@30 fps

Audio Interfaces
I2Sx2
Integrated audio codecx1, 8- or 16-bit voice inputs and outputs
Connection to the external audio codec, 8- or 16-bit voice inputs and outputs

Peripheral Interfaces
UARTx4
IRx1, I2Cx1, SPIx1 (master/slave mode), GPIOs, and PWMx6
PCIe 1.1x1, EP and RC
SDIO 2.0x2, maximum capacity of 32 GB
USB 2.0 Hostx2, hub
GMACx1, supporting RGMII and MII modes, 10 Mbit/s or 100 Mbit/s full-duplex or half-duplex mode, and 1000 Mbit/s full-duplex mode

External Memory Interfaces
DDR2 or DDR3 SDRAM
- 32-/16-bit DDR2/DDR3@500 MHz
- Maximum capacity of 1 GB

SPI/NOR flash
- 1-, 2-, or 4-bit SPI/NOR flash

NAND flash
- 8 bits
- SLC, MLC, and 1-, 4-, 8-, or 24-bit ECC
- Components with 8 GB capacity or larger NOR flash or NAND flash boot mode

SDK
SDK based on Linux 2.6.35
High-performance H.264 PC decoding library

Physical Specifications
Power consumption
- Typical power of 1200 mW
- Multiple-level power-saving mode

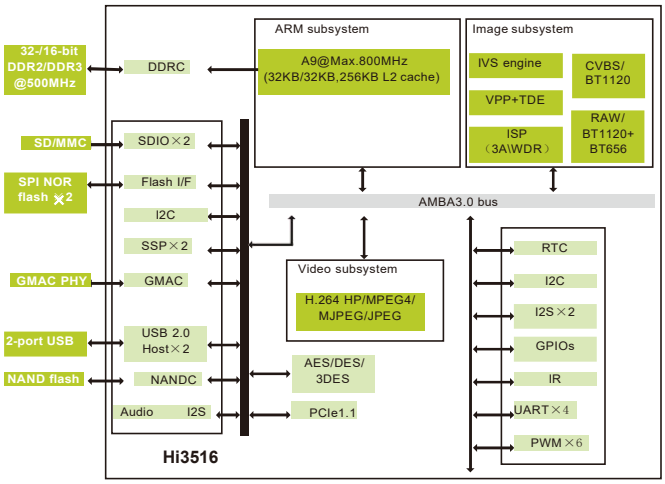
Operating voltage
- 1.0 V core voltage
- 3.3 V I/O voltage, 2.5 V PCIE voltage, and 5 V tolerance voltage
- 1.5 V or 1.8 V DDR2/DDR3 SDRAM voltage

Ambient temperature
- 20°C (–4°F) to +70°C (+158°F)

Package
- 416-pin FC-CSP

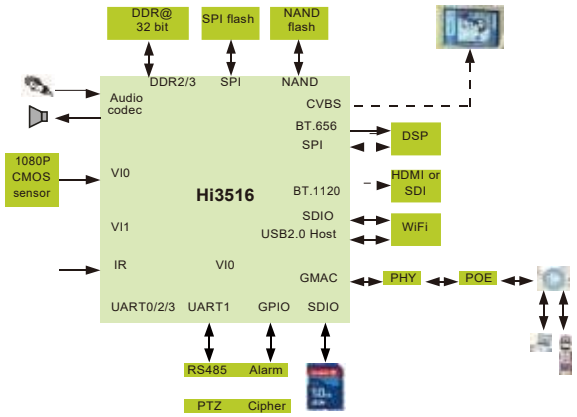
0.65 mm ball pitch and 15 mm x 15 mm body size

Functional Block Diagram



As the surveillance mode switched from the analog CCTV to DVR, networking, high definition, and intelligence gradually became essential features required in the development trend. The requirements on the high-performance (HP) IP camera are also defined. The Hi3516 is a professional high-end SoC based on the HP IP camera application. With the high performance of encoding H.264 streams (1080p@30 fps), high quality of ISP and encoded videos, and high-performance intelligent acceleration engine, the Hi3516 meets various requirements on function, performance, and picture quality of the IP camera. At the same time, the cost is reduced significantly.

Hi3516 IPC Solution with a Single Sensor



Hi3516 IPC Solution with Dual Sensors