

NXP 1080p/60 High-Profile H.264 IP camera products ASC884xA & ASC885xA

Integrated solutions for full HD security IP cameras with H.264 compression

A range of pin-to-pin compatible, high-definition surveillance camera products that integrate full functionality from raw image sensor data input, image signal processing (ISP), and High-Profile H.264 compression to secure transmission over the network. The 'Advanced' version offers improved image enhancement capabilities for low light conditions and frame-rates up to 1080p/60. All versions are fully pin-to-pin compatible with the previous IP camera products of NXP, enabling easy design upgrades without the need for hardware modifications.

Key features

- 12 MPixel sensor support
- High-Profile H.264, with flexibility to encode any resolution of 2 Mpixel @ 60 fps or 5 Mpixel @ 25 fps
- Support of parallel substream of D1 @ 30 fps
- Support of parallel 1080p MJPEG substream of 45 fps
- ROI encoding and SVC-T for H.264 compression
- Intelligent video support, motion detection in 16 separate windows, boundary control, and virtual fence
- I^2S audio and multiple audio codecs
- 24-bit video output for up to 1080p @ 60 fps
- 600 MHz ARM926 CPU
- SDRAM DDR-II/III support up to a total of 2 GB
- Compact TFBGA-484 package (15 x 15 mm, 0.65 mm pitch)
- 12-bit gamma correction
- Independent R/B/Gb/Gr black clamp
- 64 bins R/G/B histograms

Key benefits

- Advanced image processing pipeline with 3D noise reduction, edge enhancement, and motion adaptive de-Interlacing
- Best moving video quality at very low H.264 bitrate
- <1.5 W power consumption for 1080p @ 60 fps operation
- Independent H.264 and MJPEG hardware compression engines for multi-stream and multi-encoding
- Flexible picture quality tuning to meet any specific camera requirements
- Advanced Auto White Balance (AWB), Auto Exposure (AE), Auto Focus (AF) accumulators
- Pin-to-pin and software-compatible family of products from 720p @ 30 fps to 1080p @ 60 fps
- Reference design and software development kit (SDK) available for fast time-to-market
- SDK supports a wide range of image sensors from all major image sensor manufacturers

Key applications

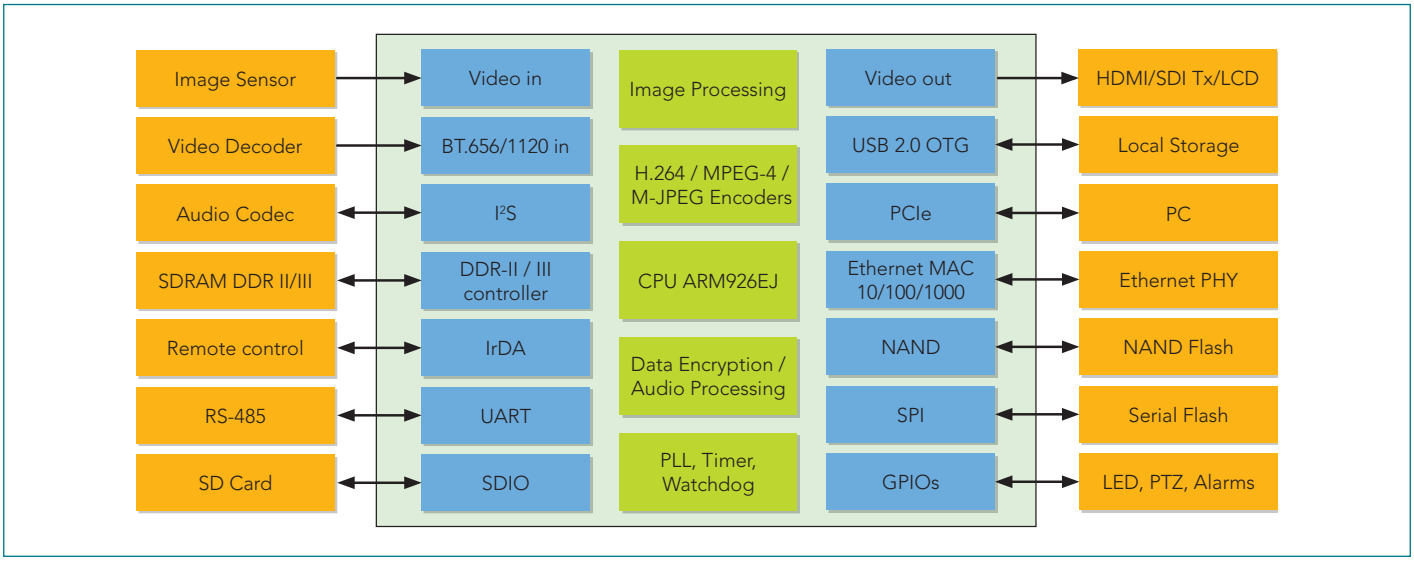
- Surveillance IP cameras
- Car video recorders
- Digital video recorders (8x D1)
- Video conferencing
- Video door phones and intercoms
- Industrial vision

The transition of standard-definition analog CCTV cameras to high-definition digital IP cameras is rapidly increasing in video security, entailing the move from analog cable networks to digital switched networks. This move brings along additional advantages, such as support of longer distances without losing quality, fewer interference issues, integration with existing data networks, and internet access of the camera video stream at any location worldwide.

NXP's integrated IP camera products take care of the image optimization, low delay and low bitrate compression, and secure transmission to the IP network by the integrated Ethernet controller.

The IP camera products also support USB, SPI, PCIe, UARTs, and GPIO interfaces for control functions such as pan/tilt/zoom (PTZ). The I²S interface provides local audio recording and playback functionality. A video output is available to display the captured video for local viewing.

ASC884xA, ASC885xA IP camera block diagram

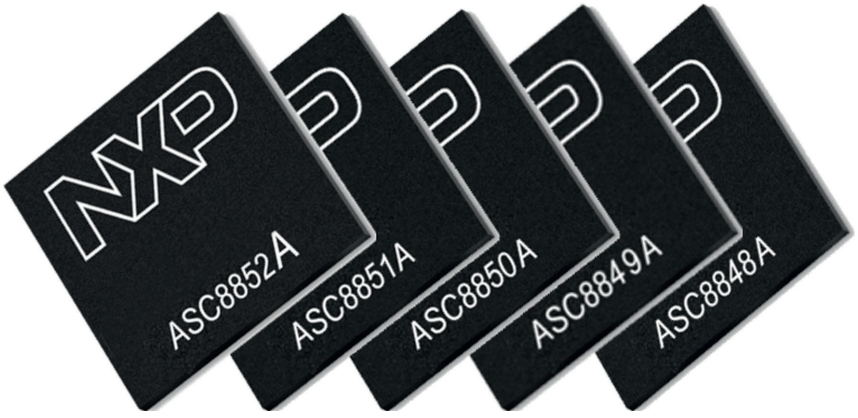


Selection guide for ASC884xA, ASC885xA family

Product feature		ASC8848A	ASC8849A	ASC8850A	ASC8851A	ASC8852A
ARM926EJ frequency		400 MHz	500 MHz	600 MHz	600 MHz	600 MHz
Max sensor resolution		5 MPixels	5 MPixels	12 MPixels	12 MPixels	12 MPixels
Video compression max performance	H.264	720p @ 45 fps or 1080p @ 20 fps or 4 x D1 @ 30 fps	SXGA @ 45 fps or 1080p @ 25 fps or 5 x D1 @ 30 fps	1080p @ 35 fps or 7 x D1 @ 30 fps	1080p @ 45 fps or 9 x D1 @ 30 fps	1080p @ 65 fps or 13 x D1 @ 30 fps
	MPEG-4 (instead of H.264)	720p @ 25 fps	SXGA @ 24 fps	1080p @ 17 fps	1080p @ 17 fps	1080p @ 17 fps
	MJPEG (in addition to H.264/ MPEG-4)	720p @ 45 fps	1080p @ 30 fps or SXGA @ 60 fps	1080p @ 45 fps	1080p @ 45 fps	1080p @ 45 fps
Video input	Bayer RGB/CMYG	12 bits: 1-ch	16 bits: 1-ch	16 bits: 1-ch	16 bits: 1-ch	16 bits: 1-ch
	BT.1120	N/A	1-ch	1-ch	1-ch	1-ch
	BT.656	4-ch	8-ch	8-ch	8-ch	8-ch
	BT.601	1-ch 8-bit	2-ch 8-bit or 1-ch 16-bit			
Video output	Output pins	8	24	24	24	24
	BT.656	8-bit				
	RGB 24-bit	N/A	1080p @ 60 fps	1080p @ 60 fps	1080p @ 60 fps	1080p @ 60 fps
	BT.1120	N/A	1080p @ 60 fps	1080p @ 60 fps	1080p @ 60 fps	1080p @ 60 fps
Interfaces	I²S	x1	x5	x5	x5	x5
	SPI	x1	x2	x2	x2	x2
	SD/SDIO/MMC	x1	x2	x2	x2	x2
	UART	x2 (1 full + 1 partial)	x4 (2 full + 2 partial)	x4 (2 full + 2 partial)	x4 (2 full + 2 partial)	x4 (2 full + 2 partial)
	NAND Flash	x1	x2	x2	x2	x2
SDRAM channels, each supporting up to 1 GB DDR-III or up to 512 MB for DDR-II		1-ch @ 266 MHz	2-ch @ 333 MHz	2-ch @ 400 MHz	2-ch @ 400 MHz	2-ch @ 400 MHz
Ethernet MAC		MII	MII/GMII/RGMII	MII/GMII/RGMII	MII/GMII/RGMII	MII/GMII/RGMII

ASC885xA technical specs

Sensor and video input	▸ Up to 12 MPixels 16-bit raw data (RGB and CMYG) with pixel clock up to 180 MHz. ▸ Direct interface with CMOS sensors and support for CCD image sensor with external analog front-end ▸ Support for external decoders with BT.656, quad-multiplexed BT.656, BT.1120, BT.601 interface and HDMI/HD-SDI receivers
Image processing	▸ Color and gamma correction ▸ 3D noise reduction, edge-enhancement and motion adaptive 3D de-interlacing ▸ Digital WDR, advanced contrast enhancement ▸ Auto white balance, auto exposure ▸ Auto iris, auto focus, zoom control and IR-cut filter support through SW and GPIOs ▸ Cropping, mirroring, flipping, up and down scaling ▸ Photometric and geometric lens distortion correction ▸ Privacy mask ▸ Motion detection for up to 16 windows
Video compression	▸ Up to 1080p @ 65 fps or D1 @ 390 fps H.264 video compression ▸ Baseline, Main, and High Profile for H.264, supporting CAVLC and CABAC entropy encoding with VBR, CBR and CVBR ▸ Up to two reference frames for motion estimation ▸ ROI encoding ▸ SVC-T support enabling H.264 (1080p @ 30 fps + 1080p @ 15 fps + 1080p @ 7.5 fps + 1080p @ 3.75 fps) ▸ Support for MPEG-4 simple profile up to 1080p @ 17 fps and MJPEG baseline with up to 1080p @ 45 fps ▸ Multi-stream and multi-encoding support: e.g. H.264 (1080p @ 30 fps + 720p @ 30 fps) + MJPEG (1080p @ 30 fps)
Audio	▸ Up to five I^2S channels (four input only and one input/output to support playback) ▸ Multiple codecs: G.711, AAC, GAMR, G.726
Video output	▸ Up to 24-bit RGB supporting up to 1080p @ 60 fps to HD-SDI Tx/HDMI Tx/LCD ▸ BT.1120 to HD-SDI Tx/HDMI Tx ▸ BT.656
Data encryption	▸ AES, TDES, DES, SHA-1, SHA-224, SHA-256, SHA-384, SHA-512
CPU	▸ ARM926EJ-S CPU with 16 KB I-Cache and 16 KB D-cache operating at up to 600 MHz on Linux 2.6
Memory	▸ Two x 16-bit SDRAM memory channels, each supporting up to 1 GB DDR-III or 512 MB DDR-II @ 400 MHz
Interfaces	▸ Ethernet MAC 10/100/1000, USB 2.0 OTG, PCIe 1.1, SPI, SD/SDIO/MMC, UARTs, IrDA



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