CX93610

DIFT JPEG Encoder with a 656 Camera Interface and Optional Microphone Input

The CX93610 is a monolithic mixed signal Application-Specific Standard Product (ASSP) designed for low cost and low power motion detection surveillance camera applications, as well as home monitoring/remote monitoring applications. Used with an external CMOS image sensor, the CX93610 offers a variety of specialized JPEG encoding techniques to highly compress and save image data in an internal 512KB/256KB frame buffer. An optional 2:1 and 4:1 scaler is available for image re-sizing. In addition, a 4:2:0 sub-sampling conversion is available to further reduce image file sizes. With a microphone input and programmable allocated buffering, a 2- or 4-bit ADPCM audio session can be recorded simultaneously during image captures. The stored images and audio data are then passed on to an external microprocessor for uploading to a desired medium.

The CX93610 is controlled through a simple register set via the microprocessor interface, and the variety of available interfaces (Serial Peripheral Interface [SPI], UART, and I^2C) allow for wide flexibility in microprocessor selection. With both digital and analog photocell sensor inputs available, the CX93610 can facilitate the measurement of ambient light and use an on-chip LED driver to control an external infrared LED during low-light conditions. With low cost, low power, and high image compression capability, the CX93610 is ideally suited for security and monitoring applications.

Key Features	Benefits
Integrated mixed-signal design for analog-to-digital image processing	No External components required for image conversion
On-chip 512KB/256KB frame buffer	No external RAM required
Supports enhanced JPEG compression techniques and >1MP CMOS sensors and processes both color and black and white images	Provides excellent image processing up to 30 fps
DIFT Encoded JPEG reduces file sizes by up to 99 percent	Faster transfer time and longer battery life
Low sleep mode power - 10nA and low operating power (target <15mA)	Longer battery life and energy-efficient design generates less heat.
Frame by Frame Motion Detection with programmable thresholds	Enhances monitoring by alerting host of activity
Integrated analog components (ADCs, LCD driver)	No analog components required
I^2C, SPI, and UART interfaces for flexible connectivity	Allows for wide selection of microprocessors
Register-driven device	Simple operation, no CPU
Optional microphone input records audio session simultaneously during image captures	Provides complete A/V solution with flexible frame buffer for audio and video data storage

Applications

- PIR Sensor with Video
- Video Intercom/Door Phone
- Baby monitor applications
- Remote home monitoring
- Low-end surveillance camera

Part Number CX93610

Description DIFT JPEG Encoder with a 656 Camera Interface and Optional Microphone Input

CX93610 Features

Operating Modes

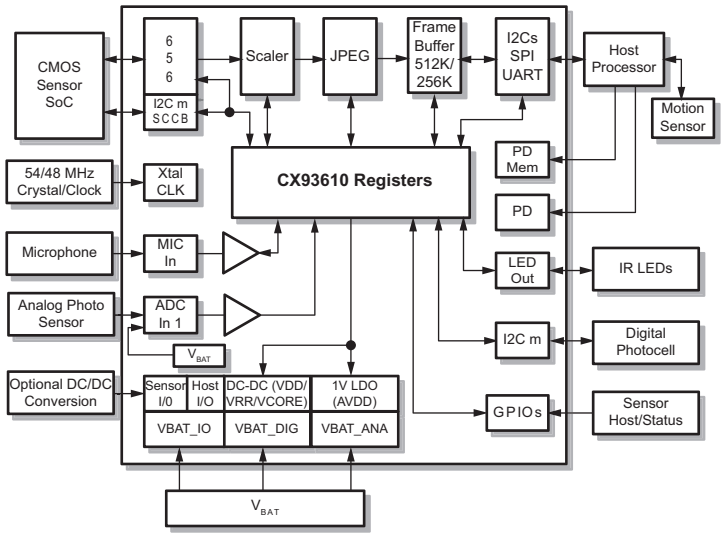
- Visual verification of intruder via image sensor interface
- SXGA 1.3MP (1280x1024) and HD (1280x720) - B&W or Color @ up to 15 fps (512KB option only)
- D1 (720x480) and VGA (640x480) - B&W or Color @ up to 30 fps
- Up to 5MP (2592x1944) - B&W or Color, JPEG still captures (512KB option only)
- Resolution Scaling of ½ or ¼ (available for input resolutions of 1280x1024 or lower)
- 4:2:2 to 4:2:0 Sub-Sampling Conversion (available for input resolutions of 1280x1024 or lower)
- JPEG & MJPEG Image Compression (ISO/IEC 10918-1/2)
- Programmable Difference Threshold Encoded JPEG Mode (DIFT)
- Differential Encoded JPEG Mode (DIFF)
- Programmable DCT tables for ultimate flexibility in compression and image quality (2 pre-defined tables)
- Privacy Mode - blurs out image details
- Frame by Frame Motion Detection with programmable thresholds
- Light Detection through luminance measurements with auto IR LED control
- Continuous streaming and variable image modes
- 512KB/256KB frame buffer for compressed images (no external memory) with programmable audio buffer allocation
- Interface to external mP though SPI, UART, or I^2C
- Variable IR illumination control port
- A/D for Photocell sensor, Battery voltage monitor, and microphone inputs
- Sleep mode - SoC off except frame buffer in retention mode
- Integrated DC-DC converter for reduced power consumption

Interfaces

- Sensor i/f
  - 8-b 4:2:2 YCbCr with BT-656 embedded timing codes or frame/line sync support up to 54 MHz, progressive mode
  - Resolutions: 5MP (2592x1944), 1.3MP SXGA (1280x1024), (VGA (640x480) & QVGA (320x240)
  - 54 MHz or 48 MHz clk output with divide-by-two option for 27 MHz or 24 MHz output
  - Crystal/Clock input allowing 54 MHz, 48 MHz, 27 MHz, or 24 MHz. Supports fundamental and 3rd overtone crystals
  - 2/3 wire control i/f: I^2C Master port or SCCB
- 4-wire I^2C/SPI/UART slave port to external mP
- 8 GPIO (5 dedicated pins, 3 shared pins)
- IR illumination with variable DAC control
- Microphone input, mic boost 0-36 dB in 6 dB steps, 2- and 4- bit ADPCM
- DC measurement battery monitor
- Photocell sensor input - analog or I^2C (shared with GPIO)
- Support for battery operation: 3.6 V to 1.8 V

56-pin eMLF/QFN

- -10 °C to +85 °C ambient,
- +100 °C junction
- Full industrial temperature version available (-40 °C to +85 °C)
- TBD mA in operational mode
- 10 nA in sleep mode



CX93610 Functional Block Diagram

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