

CMOS Sensors - MB86S02A & MB86S03



► Features

MB86S02A: 110k Pixel (Sensor & Color Processor in Single Chip)

MB86S03: 350k Pixel (Sensor & Color Processor in Single Package)

- Optical format
 - 1/7-inch - S02A
 - 1/4-inch - S03
- Array size
 - 357 (Horizontal) and 293 (Vertical) pixels - S02A
 - 661 (Horizontal) and 505 (Vertical) pixels - S03
- RGB mosaic is used as color filter with micro lens
- Lowest power consumption among all the CMOS image sensors in the world
 - 30 mW at 15 frames per second - S02A
 - 78 mW at 15 frames per second - S03
- 9 MHz standard input clock - S02A
 - 13.5 MHz standard input clock - S03
- Output format
 - 8-bit parallel YCbCr422/YUV422 - S02A
 - RGB565 8bit parallel YCbCr422/YUV422 - S03
 - CMOS level digital with selectable hi-Z
- Color Signal Processor
 - Auto gain control (AGC)
 - Auto exposure control (AE)
 - Auto white balance (AWB)
- Gamma correction
- Aperture correction
- Edge enhancement - S03 only
- Anti flicker function
- Register Control
 - I2C serial interface
- Additional Functions
 - CIF (352 x 288) / QCIF (176 x 144) Switch function.
 - CCIR656 standard header output (only with CIF function - S02A)
 - High speed/slow shutter - S03 only
 - VGA/QVGA/QQVGA/GCIF - S03
 - Power-save mode
 - Scanning direction variation
 - Stand-by function (3uW)
 - Digital zoom (x1.5,x2,x3@QCIF) - S03 only
- 2.8V CMOS technology, 21 pin flexible cable (7.80mm x 6.98mm x 3.95mm) - So2A
 - Back light mode - S03 only
 - Monochrome/Sepia Mode
- 2.8V CMOS technology, 21-pin flexible cable (8.00mm x 10.7mm x 5.54mm) - So3

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► Descriptio

Fujitsu's MB86S02A is a single-chip implementation of a complete digital camera with lens, capable of doing color filter array interpolation, color calibration, anti-aliasing, infrared rejection and color processing. It incorporates a highly sensitive photodiode array, FPN reduction read out circuitry, analog to digital converter, timing generator and a digital color processor. The excellent analog circuit design, that integrates the CMOS image sensor and the color signal processor into a single chip, enables very low power consumption and a smaller size. The image sensor is a 110K pixel including CIF (352 x 288) compatible image array size with additional QCIF-sized output. All camera functions, such as gain, white balance, black clamp level, color processing, and gamma correction are programmable through I2C serial interface.

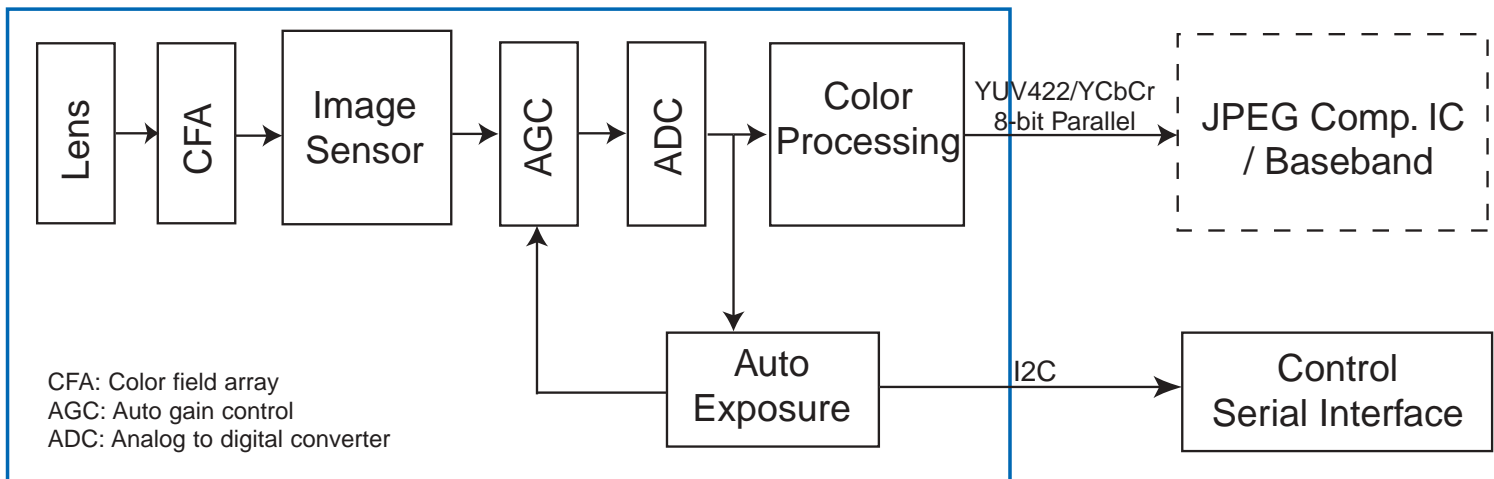
MB86S03 is 350k pixel CMOS sensor camera module that includes color processor LSI in one package. Being an upgraded version of MB86S02A, it can support the

resolution as high as VGA (640x480) and as low as QCIF (176x144). Some additional features like digital zoom, high speed shutter, edge enhancement and back light mode are also added in MB86S03.

MB86S02A/S03 is based on CMOS technology, using active pixel sensors, dominating the CCDs (charge-coupled devices) in many ways. The biggest advantage of using CMOS technology is that one or more active transistors can be integrated into the pixel. Its inherent power efficiency and smaller size is attractive for portable devices, where every bit of size, weight and power savings pays off in reduced costs and improved battery efficiency. These qualities are paving the way for a whole new generation of portable imaging products such as video or still camera-equipped cell phones and electronic organizers.

► Applications

- Cellular Phone
- PDA



MB86S02A/MB86S03 (in blue outline) implemented in a cellular phone application

System Block Diagram

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