



Himax CMOS Imaging Camera - HM01B0

SEN-15570

The HM01B0 from Himax Imaging is an ultra low power CMOS Image Sensor that enables the integration of an “Always On” camera for computer vision applications such as gestures, intelligent ambient light and proximity sensing, tracking and object identification. The sensor allows the sensor to consume very low power of <math><2\text{mW}</math> at QVGA 30FPS. This low power consumption and vision applications make this camera the perfect pair for the [SparkFun Edge Development Board](#) and comes with a ribbon cable that mates to the [camera connector populated on the Edge board](#).

The HM01B0 contains 320 x 320 pixel resolution and supports a 320 x 240 window mode which can be readout at a maximum frame rate of 60FPS, and a 2x2 monochrome binning mode with a maximum frame rate of 120FPS. The video data is transferred over a configurable 1bit, 4bit or 8bit interface with support for frame and line synchronization. The sensor integrates black level calibration circuit, automatic exposure and gain control loop, self-oscillator and motion detection circuit with interrupt output to reduce host computation and commands to the sensor to optimize the system power consumption.

Note: The [SparkFun Edge](#) is NOT included with the camera and will need to be purchased separately.

FEATURES

Image Sensor

- Ultra Low Power Image Sensor (ULPIS) designed for Always On vision devices and applications
- High sensitivity 3.6 μ BrightSense™ pixel technology
- 320 x 320 active pixel resolution with support for QVGA window, vertical flip and horizontal mirror readout
- Programmable black level calibration target, frame size, frame rate, exposure, analog gain (up to 8x) and digital gain (up to 4x)
- Automatic exposure and gain control loop with support for 50 / 60Hz flicker avoidance
- Flexible 1bit, 4bit and 8bit video data interface with video frame and line sync
- Motion Detection circuit with programmable ROI and detection threshold with digital output to serve as an interrupt
- On-chip self oscillator
- I2C 2-wire serial interface for register access
- High CRA for low profile module design

Sensor Parameters

- Active Pixel Array 320 x 320
- Pixel Size 3.6 μ m x 3.6 μ m
- Full Image Area 1152 μ m x 1152 μ m
- Diagonal (Optical Format) 1.63 mm (1/11")
- Color Filter Array Monochrome and Bayer
- Scan Mode: Progressive
- Shutter Type: Electronic Rolling Shutter
- Frame Rate MAX 51 fps @ 320 x 320, 60 fps @ 320 x 240 (QVGA)
- CRA (maximum) 30°

Sensor Specifications

- Supply Voltage: Analog - 2.8 V, Digital - 1.5V (Internal LDO: 1.5V – 2.8V), I/O - 1.5 – 2.8V
- Input Reference Clock: 3 – 50 MHz
- Serial Interface (I2C): 2-wire, 400 KHz max.
- Video Data Interface: 1b, 4b, 8b with frame / line SYNC
- Output Clock Rate MAX: 50 MHz for 1bit, 12.5 MHz for 4bit, 6.25 MHz for 8bit
- Est. Power Consumption (include IO with 5pF load):
 - QVGA 60FPS (Typical) <4 mW
 - QVGA 30FPS (Typical) <2 mW

