



ICM202B CIF/QCIF CMOS image sensor with digital YUV output

Outline Specifications V2.0

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Features

- 101,376 (352x288) pixels, CIF format, used with 1/7" optical system
- Correlated double sampling
- On-chip 9-bit ADC
- On-chip digital signal processing
 - Real-time color interpolation
 - Programmable/ Automatic exposure control
 - Programmable/ Automatic white balancing and color correction
 - Programmable sharpening control
 - Programmable color saturation control
 - Programmable gamma correction
 - Programmable brightness correction
 - Programmable hue correction
 - Programmable contrast correction
 - Programmable anti-flickering (50Hz, 60Hz or off, like outdoor)
- Progressive readout
- Video mode and single frame mode
- Output data format: 8/16-bit YUV/YCbCr, 24-bit RGB, 16-bit RGB, 8-bit raw data
- Output modes: CIF and Sub-sampling QCIF, programmable
- Input/output interface: SIF
- Power down mode
- Automatic optical black compensation
- Left-Right Mirror image
- Up-down Mirror image
- Single power supply, 2.8+/- 0.2V and/or 3.3V +/- 0.15V

General Description

This is a single-chip digital color imaging device. It incorporates a 352 x 288 sensor array operating at max. 30 frames per second in progressive manner. Each pixel is covered by a color filter, which formed a so-called Bayer pattern. Correlated double sampling is performed by the internal ADC and timing circuitry.

Depending on the brightness of the scene, the raw data can be adjusted by the digital gain for all pixels, or be adjusted separately for the 4 Bayer pattern pixels. This is done either by the built-in automatic exposure control circuit, or can be done manually by the external CPU via serial bus control.

The data are then processed by the color interpolation module so that each pixel will get a complete set of RGB values. To correct or enhance color, automatic white balance circuit is built-in. The user may perform white balancing and color correction manually by external CPU via serial bus too. Color saturation control is programmable via serial bus, if user is not satisfied with the default settings

At the final stage, the gamma correction can also be performed, in addition to default value. The output formats include 8/16-bit YUV or YCbCr, 24-bit, 16-bit RGB, and 8-bit raw data which can be fed to other DSP, color processing, or compression chips.

Application

- Video cellular phone
- PDA
- Digital camcorder
- Digital still camera
- Video phone
- Video conferencing
- Video mail
- PC camera
- Security system
- Visual toy
- Industrial image capture/analysis
- Environment monitor system

Key Parameters

- Number of Active Pixels: 352 x 288
- Number of Physical Pixels: 362 x 298
- Frame Rate: from 30 to 1 fps, flexible
- Pixel Size: 6.0 μm x 6.0 μm
- Sensor Area: 2.2 mm x 1.8 mm (for 1/7" lens)
- Main Clock Frequency: 3 to 12 MHz
- Exposure Time: 83 μs (@ 30 fps, 1 line, 12 MHz) ~ 164 s (@ 1 fps, 65535 lines, 12 MHz), every step: 83 μs
- Digital gain 1x – 64x @ 2^N for all pixels
- RGB gain from 1/256 to 8 in step of 1/256 for individual Bayer pattern pixels
- S/N Ratio: TBD dB @ TBD lux
- Target Power Supply: 2.8V +/- 0.2V
- Target Power Requirement: <31mW (@ 15fps, 6 MHz, 2.8V),
- Package: Shrunk Plastic LCC48 (ICM202Bsa)

Mechanical Information

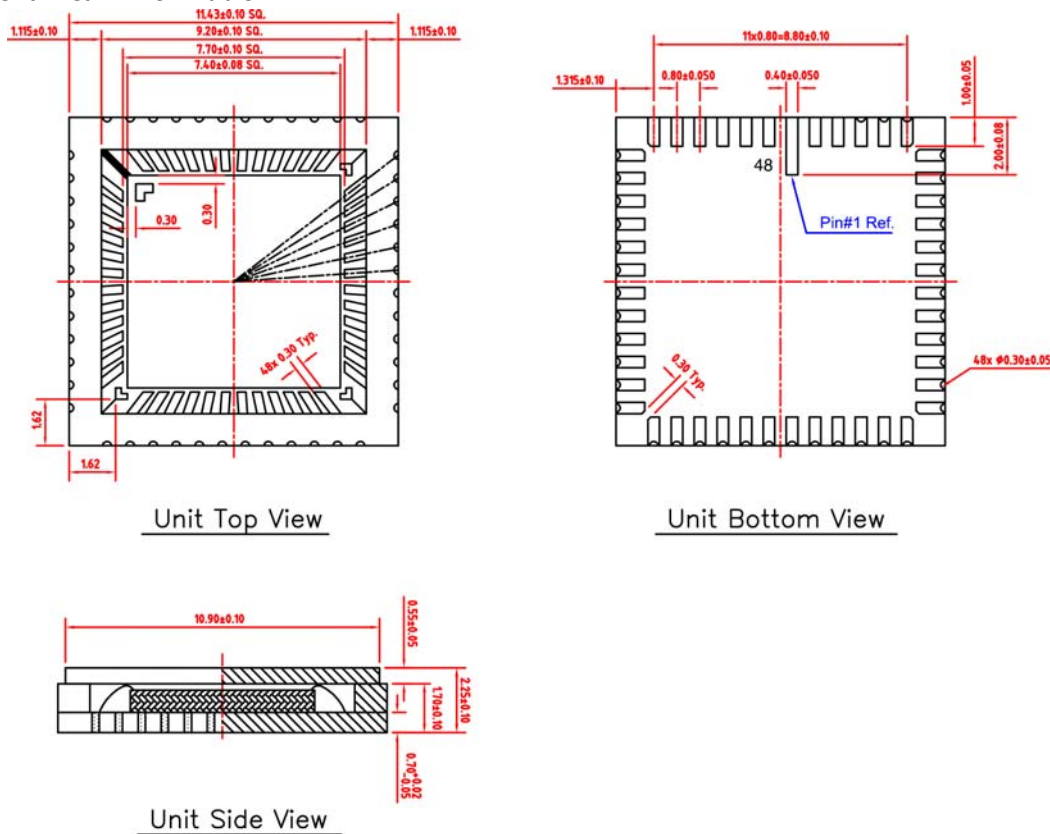


Figure 3. Shrunken PLCC48 Packaging

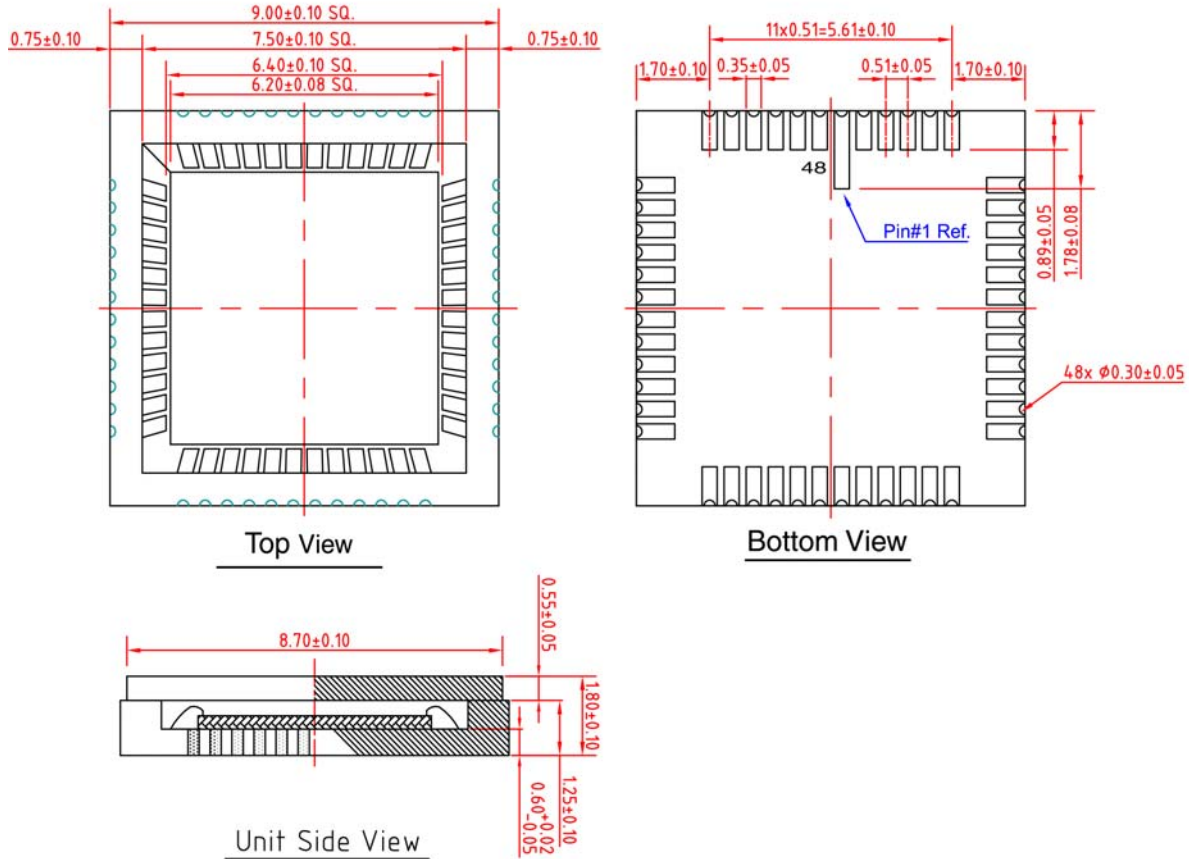


Figure 4. T Type 9 x 9 MM LCC48 Plastic Package



5. Ordering Information

<i>Description</i>	<i>Part Number</i>
"S" Type Shrunk Plastic LCC 48 package, CIF resolution sensor with YUV output	ICM-202Bsa
"T" Type LCC48 Plastic Package, CIF resolution sensor with YUV output	ICM-202Bta

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