



1/3" NTSC/PAL CMOS Image Sensor with 960x480 Pixel Array

PC1099N

Rev 0.0

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► Features

- ▷ 976 x 496 Effective pixel array with RGB bayer color filters and micro-lens
- ▷ Power supply : HVDD/CVDD/AVDD=3.3V
- ▷ Input. Clock Frequency : 27MHz
- ▷ Output formats
 - ◆ Composite Output mode
 - CVBS (NTSC/PAL)
 - ◆ Digital Output mode
 - max. 960x480 @ YUV422/RGB565/RGB444
 - max. 960x480 @ Bayer
 - ◆ Analog/Digital Output mode
 - ITU-R. BT1302 (960x240/288)
- ▷ Image processing on chip lens shading, gamma/defect/color correction NR (2D noise reduction), color interpolation, edge enhancement, brightness, contrast auto black level, auto white balance auto exposure control and back light compensation
- ▷ Free scaling (Up&Down) and Cropping
- ▷ High Image Quality And Ultra low light performance
- ▷ I2C & SPI master include
- ▷ Motion detection with Alarm mode support
- ▷ Privacy mode support
- ▷ Smart IR-LED control
- ▷ Horizontal / Vertical mirroring
- ▷ Software Reset
- ▷ Crystal input support
- ▷ On chip regulator for DVDD
- ▷ CLCC Package type supports

| | |
|-----------------------|---|
| Pixel Size | 5.00 um x 7.40 um |
| Effective Pixel Array | 976 (H) x 496 (V) |
| Effective Image Area | 4.88 mm x 3.67 mm |
| Optical Format | 1/3 inch |
| Input Clock frequency | 27Mhz |
| Frame Rate | 60 field / sec @ NTSC 50 field / sec @ PAL |
| Dark Signal | 48.8 [mV/sec] @ 60℃ |
| Sensitivity | 10.8 [V/Lux.sec] |
| Power Supply | Analog : 3.3V HVDD : 3.3V CVDD : 3.3V |
| Power Consumption | 468 mW @ Dynamic 363 uW @ Standby |
| Dynamic Range | 63.2 [dB] |
| SNR | 45.3 [dB] |

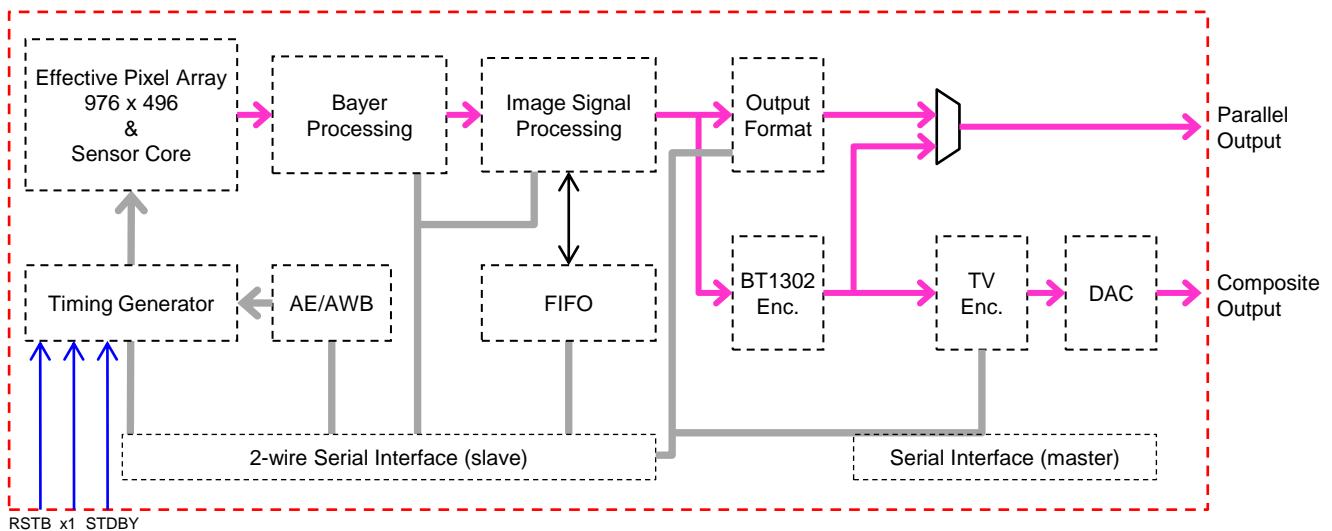
[Table 1] Typical Parameters

► Signal Environment

PC1099N don't have tolerant Input pads. The input signal must be equal to HVDD for stable operation. If the power of input signal is higher than recommended, it may flow leakage current by short circuit path in the input PADS.

► Chip Architecture

PC1099N has 976 x 496 effective pixel array and column/row driver circuits to read out the pixel data progressively. CDS circuit reduces noise signals generated from various sources mainly resulting from process variations. Pixel output is compared with the reset level of its own and only the difference signal is sampled, thus reducing fixed error signal level. Each of R, G, B pixel output can be multiplied by different gain factors to balance the color of images in various light conditions. The analog signals are converted to digital forms one line at a time and 1 line data are streamed out column by column. The Bayer RGB data are passed through a sequence of image signal processing blocks to finally produce YCbCr 4:2:2 output data. Image signal processing includes such operations as gamma correction, defect correction, low pass filter, color interpolation, edge enhancement, color correction, contrast stretch, color saturation, white balance, exposure control and back light compensation. Internal functions and output signal timing can be programmed simply by modifying the register files through 2-wire serial interface.



[Fig. 1] Block Diagram



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