NOIP1SN1300A, NOIP1SN0500A, NOIP1SN0300A

PYTHON 0.3/0.5/1.3 Megapixel Global Shutter CMOS Image Sensors

ON Semiconductor®

www.onsemi.com

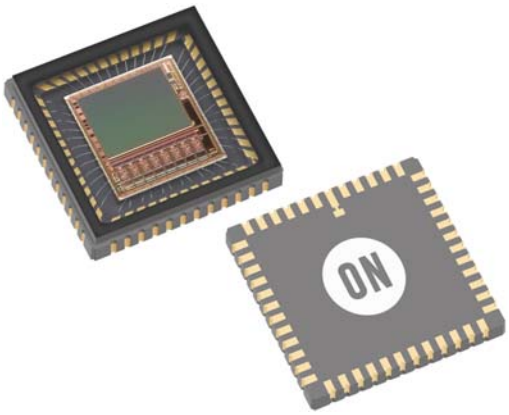


Figure 1. PYTHON 1300 Photograph

Features

- SXGA: 1280 x 1024 Active Pixels, 1/2” Optical Format
  SVGA: 800 x 600 Active Pixels, 1/3.6” Optical Format
  VGA: 640 x 480 Active Pixels, 1/4” Optical Format
- 4.8 μm x 4.8 μm Low Noise Global Shutter Pixels with In-pixel CDS
- Monochrome (SN) or Color (SE)
- Zero ROT Mode Enabling Faster Frame Rate
- Frame Rate at Full Resolution (LVDS)
  - 210/175 frames per second @ SXGA (Zero ROT/Normal ROT)
  - 560/420 frames per second @ SVGA (Zero ROT/Normal ROT)
  - 860/620 frames per second @ VGA (Zero ROT/Normal ROT)
- 43 Frames per Second (fps) at Full Resolution (CMOS)
- On-chip 10-bit Analog-to-Digital Converter (ADC)
- 8-bit or 10-bit Output Mode
- Four Low Voltage Differential Signaling (LVDS) High Speed Serial Outputs or Parallel CMOS Output
- Random Programmable Region of Interest (ROI) Readout
- Pipelined and Triggered Global Shutter, Rolling Shutter
- On-chip Fixed Pattern Noise (FPN) Correction
- Serial Peripheral Interface (SPI)
- Automatic Exposure Control (AEC)
- Phase Locked Loop (PLL)
- High Dynamic Range (HDR)
- Dual Power Supply (3.3 V and 1.8 V)
- −40°C to +85°C Operational Temperature Range
- 48-pin LCC and Bare Die
- 590 mW Power Dissipation (LVDS)
- 375 mW Power Dissipation (CMOS)
- These Devices are Pb−Free and are RoHS Compliant

Applications

- Machine Vision
- Motion Monitoring
- Security
- Barcode Scanning (2D)

Description

The Python’s high sensitivity 4.8 μm x 4.8 μm pixels support low noise “pipelined” and “triggered” global shutter readout modes. In global shutter mode, the sensor supports correlated double sampling (CDS) readout, reducing noise and increasing dynamic range.

The sensor has on-chip programmable gain amplifiers and 10-bit A/D converters. The integration time and gain parameters can be reconfigured without any visible image artifact. Optionally the on-chip automatic exposure control loop (AEC) controls these parameters dynamically. The image’s black level is either calibrated automatically or can be adjusted by adding a user programmable offset.

A high level of programmability using a four wire serial peripheral interface enables the user to read out specific regions of interest. Up to 8 regions can be programmed, achieving even higher frame rates.

The image data interface of the P1-SN/SE part consists of four LVDS lanes, facilitating frame rates up to 210 frames per second in Zero ROT mode. Each channel runs at 720 Mbps. A separate synchronization channel containing payload information is provided to facilitate the image reconstruction at the receiving end. The P2-SN/SE part provides a parallel CMOS output interface at reduced frame rate.

The PYTHON low resolution family is packaged in a 48-pin LCC package and is available in a monochrome and color version. For NIR variants, please contact your local distributor or email us at imagesensors@onsemi.com.

SPECIFICATIONS

Key Specifications

Table 1. GENERAL SPECIFICATIONS

Parameter	Specification
Pixel type	In−pixel CDS. Global shutter pixel architecture
Shutter type	Pipelined and triggered global shutter
Frame rate Zero ROT/Normal ROT mode	P1−SN/SE: 210/175 fps @ SXGA 560/420 fps @ SVGA 860/620 fps @ VGA P2−SN/SE: 43 fps
Master clock	P1−SN/SE: 72 MHz when PLL is used, 360 MHz (10−bit) / 288 MHz (8−bit) when PLL is not used P2−SN/SE: 72 MHz
Windowing	8 Randomly programmable windows. Normal, sub−sampled and binned readout modes
ADC resolution	10−bit, 8−bit (Note 1)
LVDS outputs	P1−SN/SE: 4/2/1 data + sync + clock
CMOS outputs	P2−SN/SE: 10−bit parallel output, frame_valid, line_valid, clock
Data rate	P1−SN/SE: 4 x 720 Mbps (10−bit) / 4 x 576 Mbps (8−bit) P2−SN/SE: 72 MHz
Power dissipation	P1−SN/SE: 590 mW, 10−bit mode P2−SN/SE: 375 mW
Package type	48−pin LCC

1. The ADC is 11−bit, down−scaled to 10−bit. The PYTHON uses a larger word−length internally to provide 10−bit on the output.

Table 2. ELECTRO−OPTICAL SPECIFICATIONS

Parameter	Specification
Active pixels	SXGA: 1280 (H) x 1024 (V) SVGA: 800 (H) x 600 (V) VGA: 640 (H) x 480 (V)
Pixel size	4.8 μm x 4.8 μm
Conversion gain	0.096 LSB10/e^- 140 μV/e^-
Dark temporal noise	< 9e^- (Normal ROT, 1x gain) < 7e^- (Normal ROT, 2x gain)
Responsivity at 550 nm	7.7 V/lux.s
Parasitic Light Sensitivity (PLS)	<1/8000
Full Well Charge	10000 e^-
Quantum Efficiency at 550 nm	56%
Pixel FPN	< 0.5 LSB10
PRNU	< 10 LSB10
MTF	68% @ 535 nm − X−dir & Y−dir
PSNL at 20°C	120 LSB10/s, 1200 e^-/s
Dark signal at 20°C	5 e^-/s, 0.5 LSB10/s
Dynamic Range	> 60 dB in global shutter mode
Signal to Noise Ratio (SNR max)	40 dB

To receive a detailed product data sheet and supporting documentation, visit the CISP Extranet at www.onsemi.com/MyON.

Worldwide Sales and Design Support

ON Semiconductor CMOS Image Sensor Business Unit offers standard and customized CMOS image sensors for consumer as well as industrial and professional applications. Consumer applications include solutions for fast growing high-speed machine vision, motion monitoring, medical imaging, intelligent traffic systems, security, and barcode applications. Our customized CMOS image sensors are characterized by very high pixel counts, large area, very high frame rates, large dynamic range, and high sensitivity.

ON Semiconductor maintains a worldwide network of offices, customer service centers, manufacturer's representatives and distributors. For more information on image sensors, contact imagesensors@onsemi.com.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

PB_NOIP1SN1300A/D

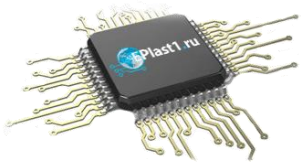
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.