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GP-PR240530 V1.0

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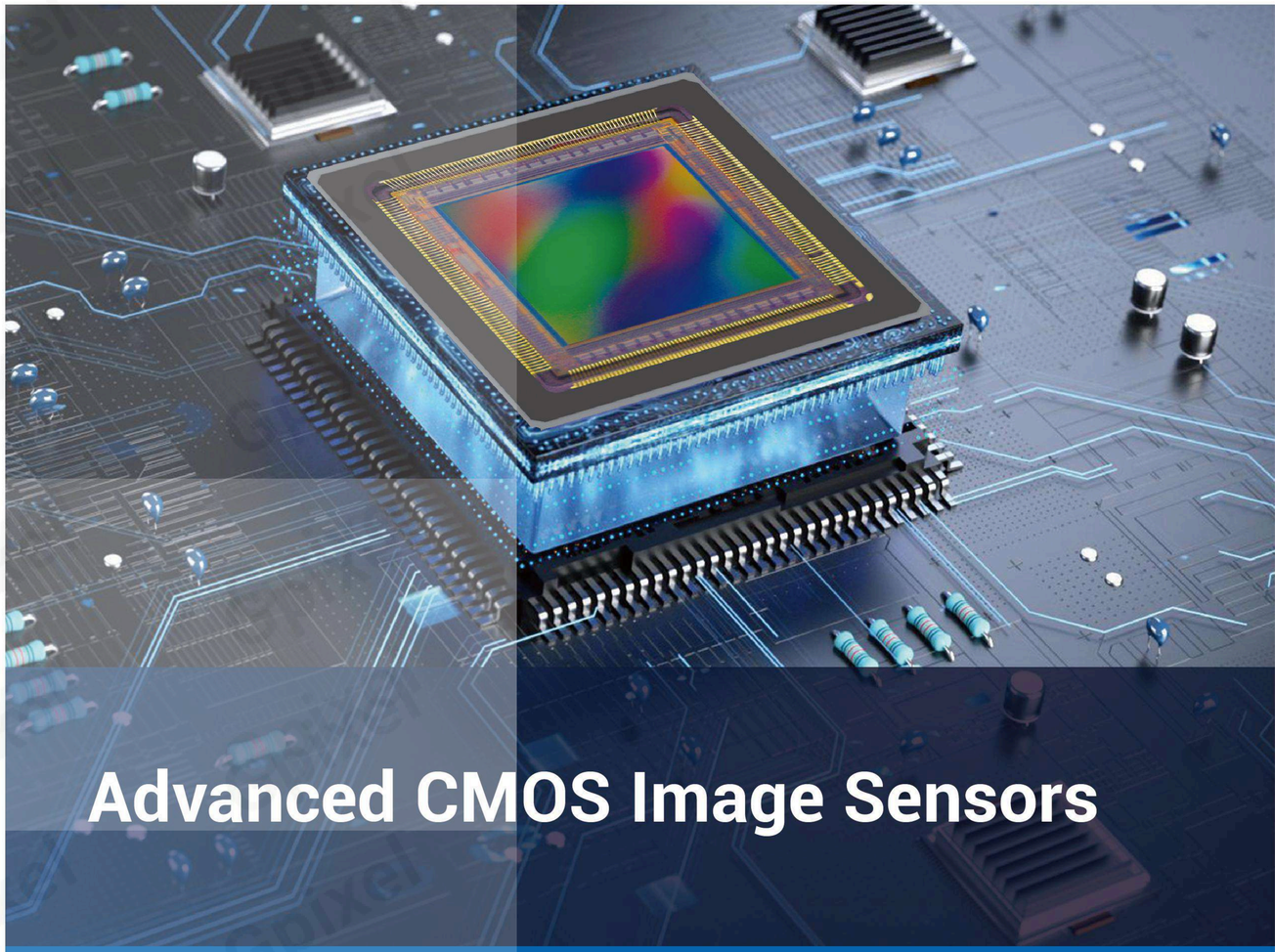
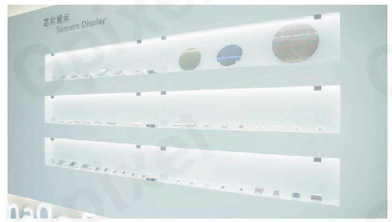


Advanced CMOS Image Sensors

GPIXEL PRODUCTS BROCHURE

+ COMPANY



Founding in 2012, Gpixel foucuses on the design and development of high-performance CMOS image sensors. Company headquarters are located in Changchun, China and additional design centers are located in Hangzhou, Dalian, Antwerp, and Tokyo. Gpixel provides advanced CMOS image sensors and exceptional customer service to camera makers around the world.

2012
Founding

Products
Advanced CMOS image sensors

Vision
Focus on technology
Insist on innovation

The Gpixel team includes first-class semiconductor physicists and globally recognized image sensor experts. Gpixel has a strong foundation of intellectual property related to charge-domain global shutter pixels, low noise circuit design, layout optimization for performance and yield of high resolution and large format image sensors, implementation of on-chip high dynamic range modes, backside illumiation with high peak quantum efficiency, and true charge transfer based time delay and integration (TDI).

Gpixel has created 7 families of more than 30 standard products covering automation & inspection, scientific imaging, medical imaging, video & photography, traffic & transportation.

Global Footprint

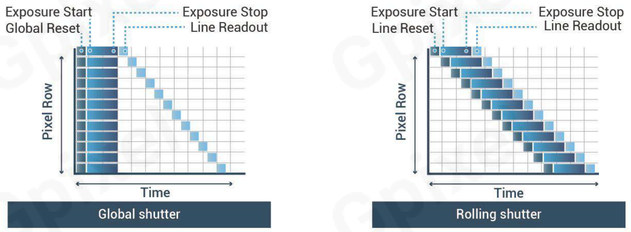
Gpixel employees from 12 countries around the world

Gpixel

Technology

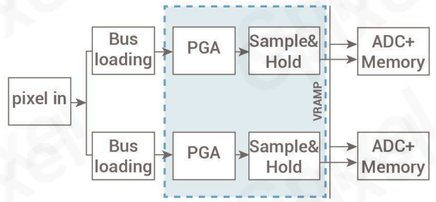
Global Shutter Pixels

- The entire pixel array can start and end exposure at the same time.
- Advanced charge-domain global shutter pixels can realize single-electron level readout noise.
- Dual microlens array design effectively optimizes shutter efficiency.



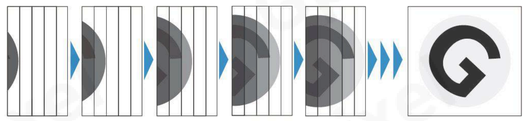
Low Noise, High Speed, High Dynamic Range

- Correlated multiple sampling technology can achieve read noise less than a single electron.
- Using interleaved time-sharing high-speed circuit design, data rates up to 1Tbps are possible.
- Dual-gain circuit designs achieve >100 dB dynamic range in a single exposure.



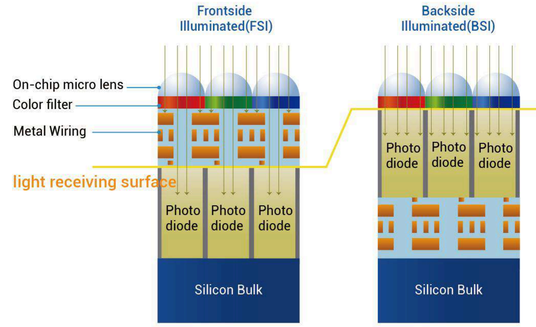
Time Delay and Integration

- In low-light environments, TDI can provide both fast scanning and high image quality while optimizing detection efficiency.
- For the same scanning speed, compared with ordinary line array sensors, less illumination is required and the system's energy consumption is lower.
- TDI is ideal for the inspection of wafers, PCBs, and displays, as well as for high throughput gene sequencing.



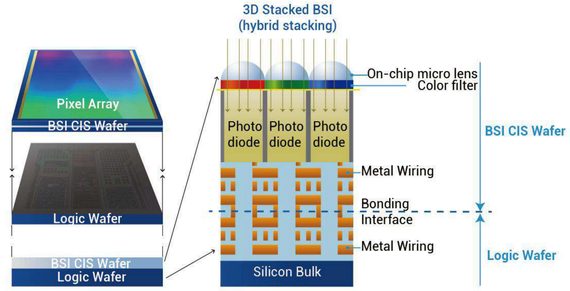
Backside-illumination

- Gpixel's self-developed backside-illumination technology achieves peak quantum efficiency over 95%.
- The spectral range can be extended from the ultraviolet to the near infrared.
- The addition of Gpixel's Pulsar technology extends the range into the soft xray region.



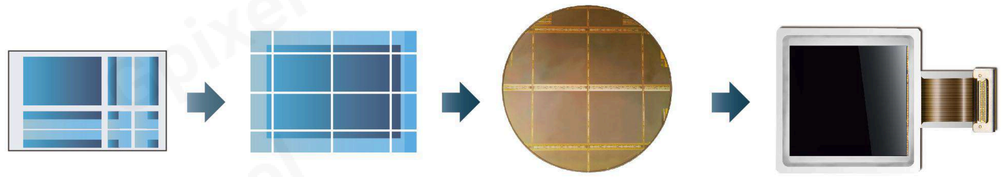
Advanced Wafer Stacking

- Pixels and supporting circuits are independently designed and the separate wafers are bonded together through copper interconnections.
- Stacked chip architectures provide small size, fast read-out rate and high integration.



Large-Area and High-Resolution Chip Design

- Breaks through the lithography limit of 24 mm x 32 mm in a single pass.
- Related design expertise allows for stitching of even dense pixel designs with minimization of boundary artifacts.



Gpixel

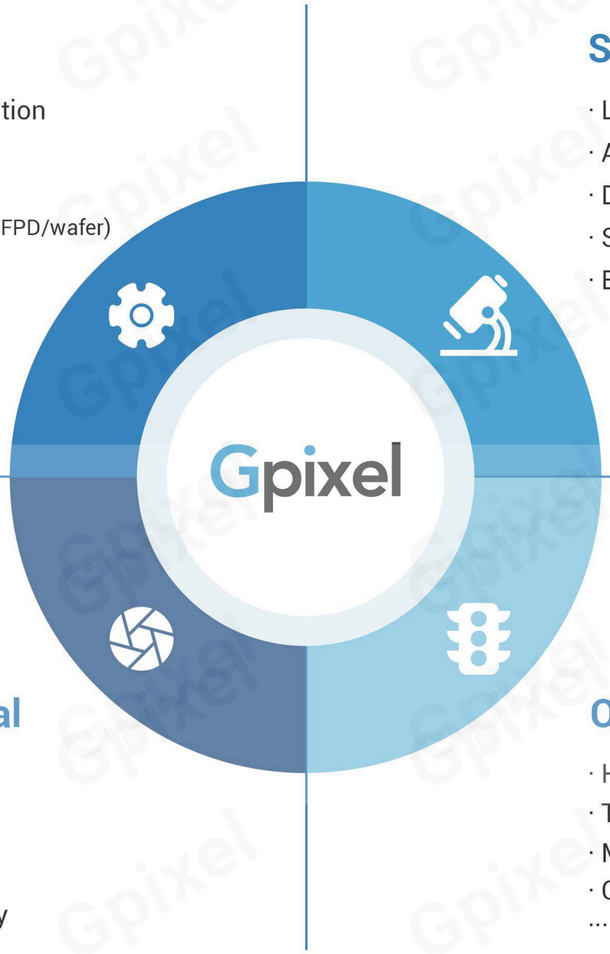
Market Segments

Industrial

· Factory Automation
· Machine Vision
· Line Scan
· Inspection (PCB/FPD/wafer)
· Logistics, AGV

Scientific

· Life science
· Astronomy
· DNA Sequencing
· Spectroscopy
· Electron Microscopy



Professional Imaging

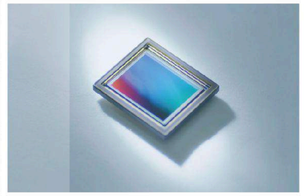
· Photography
· Video
· Cinematography

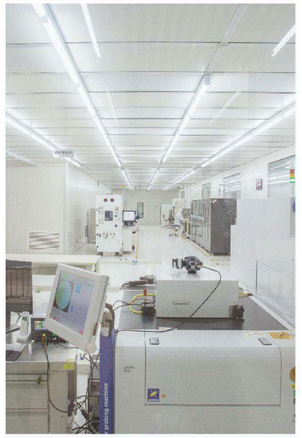
Others

· High Speed
· Traffic (ITS)
· Medical Imaging
· Custom Products
...

Using our many years of industry experience and expert technical capabilities,

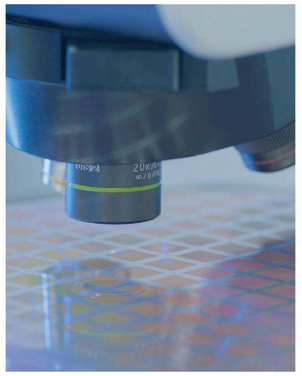
we provide advanced CMOS image sensors and quality service to our customers.





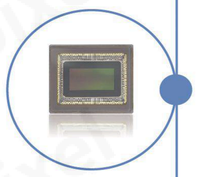
Gpixel

Advanced CMOS Image Sensors



Product Contents

7 families of standard products, meeting the needs of multiple industries



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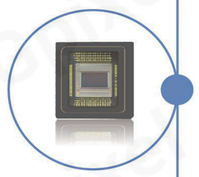

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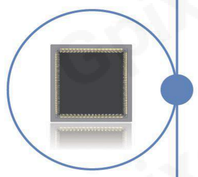

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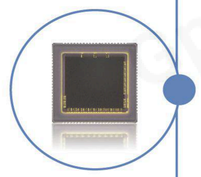

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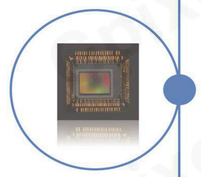

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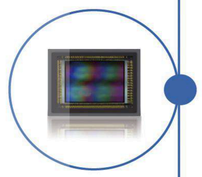

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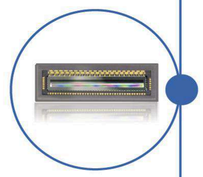

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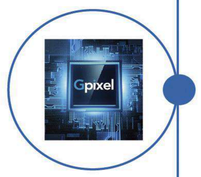

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GMAX | GSPRINT | GSENSE | GLUX | GTOF | GCINE | GL

Area Scan CMOS Image Sensor

GMAX is a series of global shutter image sensors developed by Gpixel for machine vision and industrial inspection. This family of products delivers the ideal combination of high resolution and high frame rate for industrial imaging. The pixel size ranges from 2.5 μm to 4.6 μm, and the resolution from 2.4MP to 152MP. The four products developed using the 2.5 μm pixel platform are pin-compatible for easy camera integration.

GMAX4002 GMAX3405 GMAX2505 GMAX2509 GMAX3809
GMAX3412 GMAX3413 GMAX2518 GMAX0505 GMAX4651
GMAX3265 GMAX32103 GMAX32152

Product Family Features

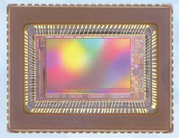
- Global Shutter
- 2.4MP-152MP resolution
- Standard Optical Formats
- High Frame Rates

Applications

- Automation & Inspection
- Traffic & Transportation
- Video Broadcasting
- Medical Imaging

GMAX4002

2.4MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX4002 is a 1/1.7" optical format image sensor with 2048 x 1200 effective pixels. Featuring an advanced charge domain global shutter pixel, GMAX4002 operates with true CDS for low noise and high dynamic range. Gpixel's Red Fox technology is employed to deliver enhanced QE for NIR applications.GMAX4002 is configurable through I2C. It integrates both Sub-LVDS and MIPI interfaces, for frame rates of 344 fps and 166 fps respectively. GMAX4002 supports 2×2 on-chip binning to achieve higher sensitivity and faster frame rate. It includes an on-chip sequencer and OTP functions.Assembled with 74-pin CLCC package, GMAX4002 enables a cost-effective camera solution, easy integration and high-reliability mass production.

Key features and Benefits

- NIR enhanced
- Low noise global shutter
- On-chip sequencer
- MIPI and Sub-LVDS Data Interfaces
- One Time Programmable (OTP) Memory

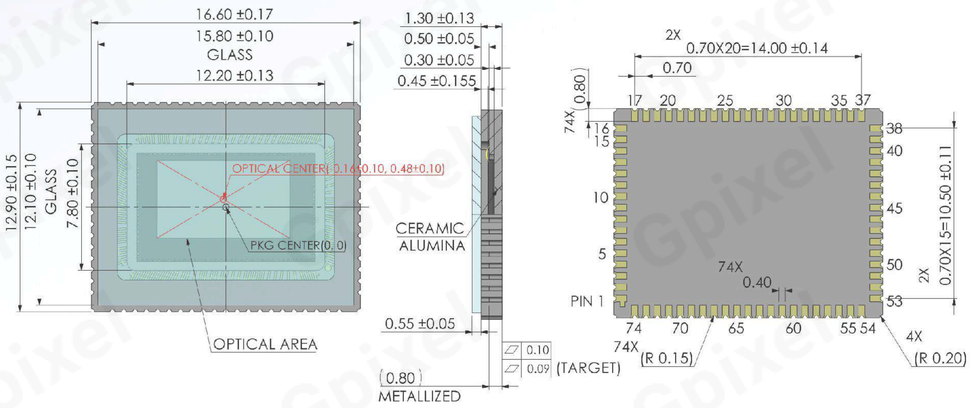
Application

·Automation & Inspection ·Logistic & Positioning ·Metrology ·Motion Capture

Specifications

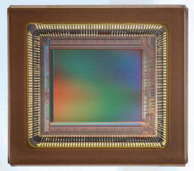
Nr of Active Pixels	2048 (H) x 1200 (V)	**Pixel size**	4.0 µm x 4.0 µm
Optical format	1/1.7"	**Shutter type**	Global shutter
Photosensive area	8.2 mm x 4.8 mm (9.5 mm diameter)	**Full well capacity**	11.6 ke⁻
Peak QE	73.7% @ 550 nm	**Temporal noise**	2.6 e⁻
Parasitic Light Sensitivity	-92.0 dB	**Dark Current**	8.3 e⁻/pixel/s @ 37°C
Angular response	> 17 degree (80% response)	**Dynamic Range**	68.0 dB @ 12 bit, 64.4 dB @ 10 bit
Max. SNR	40.7 dB	**ADC**	10/12 bit
Max Frame rate	344 fps @ 10 bit	**Channel multiplexing**	8/4/2/1 @ sub-LVDS, 4/2/1 @ MIPI
Output format	8 ch sub-LVDS , 4 ch MIPI	**Chroma**	Mono,Mono (NIR enhanced),RGB Color
Max. Data rate	9.60 Gbps	**Supply voltage**	3.3 V(analog),1.8 V – 3.3 V(IO),1.2 V(digital)
Power consumption	<0.5 W	**Package**	CLCC 74-pins (16.6 mm x 12.9 mm)

Package Drawing



GMAX3405

5MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX3405 is a 2/3" optical format CMOS image sensor with 2448 x2048 effective pixels with frame rates up to 164/100 fps in 10/12-bitmode with sub LVDS interface and 73 fps over the 4 alternative MIPI DPHY channels. Based on a high-performance 3.4 um charge domainglobal shutter pixel, GMAX3405 achieves a max full well capacity of 10ke- and min dark noise of 1.5 e-, delivering max 68.8 dB linear dynamicrange. Red Fox technology delivers QE of 75% @ 540 nm, and a NIR QEof 33% @850 nm. GMAX3405 is housed in 176 pin ceramic LGA package,17.6 mm x 15.8 mm outer dimensions, and pin-compatible toGMAX3412.

Key features and Benefits

- NIR enhanced
- Low noise global shutter
- High dynamic range
- Ultra-short exposure time

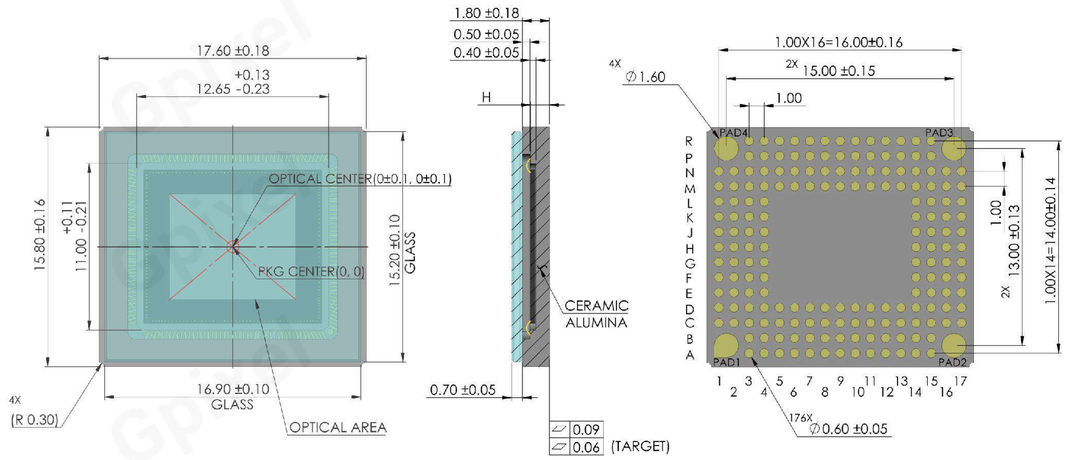
Application

·Automation & Inspection ·Intelligent Transport Systems

Specifications

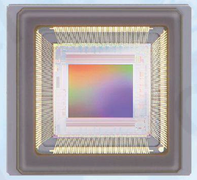
Nr of Active Pixels	2448 (H) x 2048 (V)	**Pixel size**	3.4 µm x 3.4 µm
Optical format	2/3"	**Shutter type**	Global shutter
Photosensive area	8.3 mm x 7.0 mm	**Full well capacity**	10 ke⁻ @ 12-bit and 1x PGA gain
Peak QE	75% @ 540 nm, 33% @ 850 nm	**Temporal noise**	3.6 e⁻ @ 1x PGA gain,1.5 e⁻ @ 16x PGA gain
Parasitic Light Sensitivity	-88 dB	**Dark Current**	6.5 e⁻/pixel/s @ 35°C
Angular response	> 15 (80% response)	**Dynamic Range**	68.8 dB
Max. SNR	40.0 dB	**ADC**	10/12 bit
Max Frame rate	164 fps @LVDS @ 10 bit, 100 fps @LVDS @ 12 bit	**Channel multiplexing**	12/10/8/6/4/2/1
Output format	12 ch sub-LVDS	**Chroma**	Mono (NIR enhanced), RGB Color
Max. Data rate	9.6 Gbps @Sub-LVDS,4.8 Gbps @ MIPI	**Supply voltage**	3.3V/3.6V (analog), 1.8V-3.3V (IO), 1.2V (digital)
Power consumption	<1.5 W	**Package**	176 pins LGA (17.6 mm x 15.8 mm)

Package Drawing



GMAX2505

5MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX2505 achieves more than 65% peak QE and excellent angular response. Thanks to the latest light pipe technology, more than -80 dB shutter efficiency can be achieved. The sensor supports both 10bit and 12 bit output, with frame rate up to 290 fps and 121 fps. It is assembled in a ceramic Land Grid Array (LGA) package, allowing easy integration and mass production. GMAX2505 is pin-compatible with GMAX0505, GMAX2509 and GMAX2518.All four sensors are designed with the same 2.5 µm global shutter pixel architecture and same sequencer operation, allowing reduced system costs and R&D cost for customers.

Key features and Benefits

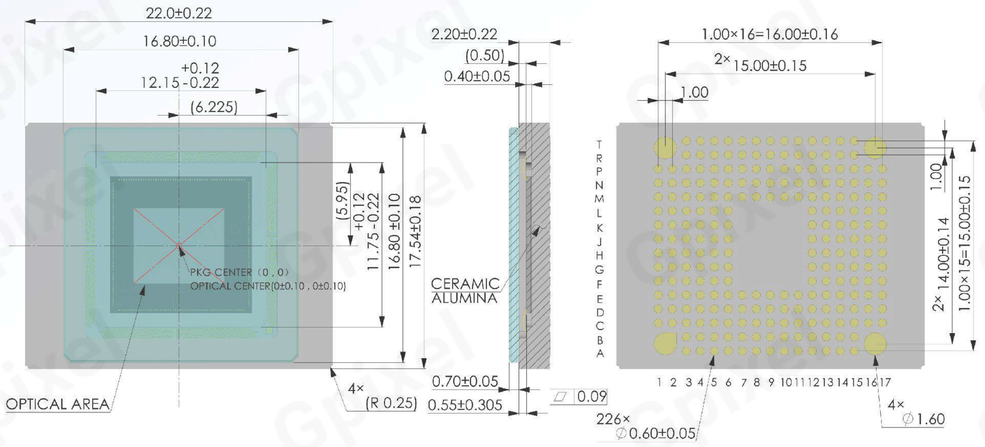
· High resolution GS in 1/2" optical format
· High data throughput > 26 Gbps
· Low noise global shutter

Application

·Automation & Inspection ·Logistic & Positioning ·Metrology ·Motion Capture

Specifications			
Nr of Active Pixels	2600 (H) x 2160 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	1/2"	**Shutter type**	Global shutter
Photosensive area	6.5 mm x 5.4 mm	**Full well capacity**	6.7 ke⁻
Peak QE	65.5% @ 500 nm	**Temporal noise**	1.8 e⁻
Parasitic Light Sensitivity	-80.0 dB	**Dark Current**	1.2 e⁻/pixel/s @ 30°C
Angular response	> 13 (80% response)	**Dynamic Range**	65.5 dB @12 bit,62.1 dB @10 bit
Max. SNR	38.2 dB	**ADC**	10/12 bit
Max Frame rate	290 fps @ 10 bit	**Channel multiplexing**	20/10/8/6/4/2
Output format	20 ch sub-LVDS	**Chroma**	Mono & RGB Color
Max. Data rate	19.20 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<0.6 W @ 12 bit, <0.9 W @ 10 bit	**Package**	226 pins LGA (19.0 mm x 17.5 mm)

Package Drawing



GMAX2509

9MP GLOBAL SHUTTER CMOS IMAGE SENSOR

GMAX2509 achieves more than 65% peak QE and excellent angular response. Thanks to the latest light pipe technology, more than -80 dB shutter efficiency can be achieved. The sensor supports both 10 bit and 12 bit output, with frame rate up to 290 fps and 121 fps. It is assembled in a ceramic Land Grid Array (LGA) package, allowing easy integration and mass production. GMAX2509 is pin-compatible with GMAX0505, GMAX2505 and GMAX2518, All four sensors are designed with the same 2.5 µm global shutter pixel architecture and same sequencer operation, allowing reduced system costs and R&D cost for customers.

Key features and Benefits

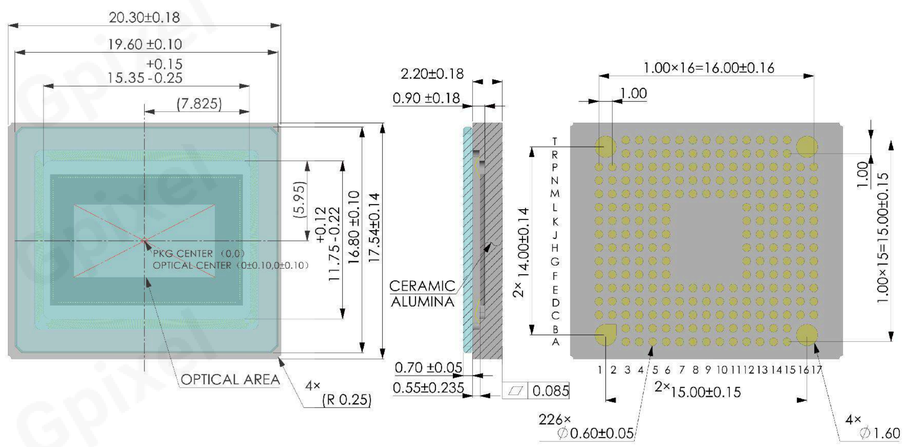
· High resolution GS in 2/3" optical format
· High data throughput > 26 Gbps
· Low noise global shutter

Application

·Automation & Inspection ·Logistic & Positioning ·Metrology ·Motion Capture

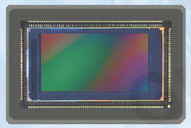
Specifications			
Nr of Active Pixels	4200 (H) x 2160 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	2/3"	**Shutter type**	Global shutter
Photosensive area	10.5 mm x 5.4 mm	**Full well capacity**	6.7 ke⁻
Peak QE	65.5% @ 500 nm	**Temporal noise**	1.8 e⁻
Parasitic Light Sensitivity	-80.0 dB	**Dark Current**	1.2 e⁻/pixel/s @ 30°C
Angular response	> 13 (80% response)	**Dynamic Range**	65.5 dB @12 bit,62.1 dB @10 bit
Max. SNR	38.2 dB	**ADC**	10/12 bit
Max Frame rate	290 fps @ 10 bit	**Channel multiplexing**	32/16/12/8/4/2
Output format	32 ch sub-LVDS	**Chroma**	Mono & RGB Color
Max. Data rate	30.72 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<0.9 W @ 12 bit, <1.2 W @ 10 bit	**Package**	226 pins LGA (20.3 mm x 17.5 mm)

Package Drawing



GMAX3809

9MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX3809 fits 4096(H) x 2160(V) (9 MP) resolution into a 1.1" image format with low noise, charge domain Global Shutter pixels running at 65 fps at 12 bit ADC resolution per pixel. GMAX3809 is configurable through SPI or I2C and supports on-chip color offset calibration, LED flicker mitigation, multiple region HDR and OTP functions. GMAX3809 is housed in a 163-pin ceramic LGA package with outer dimensions of 27.1 mm x 17.9 mm and an LGA pad pattern optimized for reliable solder connections. The sensor assembly includes a double side AR coated cover glass lid.

Key features and Benefits

· Low noise global shutter

· On-chip color offset calibration

· Excellent PLS and angular response

Application

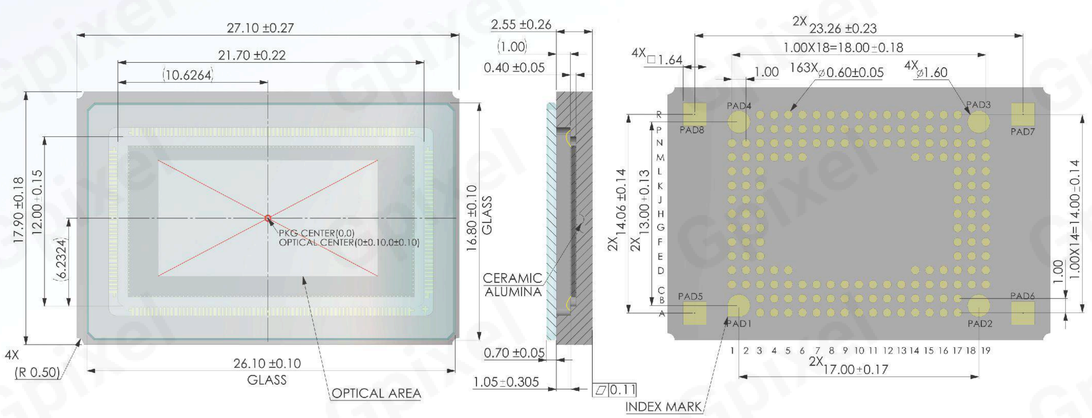
·Automation & Inspection

·Intelligent Transport Systems

Specifications

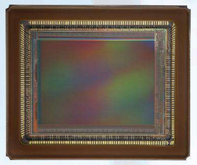
Nr of Active Pixels	4096 (H) x 2160 (V)	**Pixel size**	3.8 µm x 3.8 µm
Optical format	1.1"	**Shutter type**	Global shutter
Photosensive area	15.6 mm x 8.2 mm	**Full well capacity**	11.2 ke⁻
Peak QE	61.7% @ 540 nm	**Temporal noise**	2.2 e⁻
Parasitic Light Sensitivity	-92.0 dB	**Dark Current**	31.5 e⁻/pixel/s @ 41°C
Angular response	> 15 (80% response)	**Dynamic Range**	70.7 dB
Max. SNR	40.5 dB	**ADC**	12 bit
Max Frame rate	54 fps @ 12bit	**Channel multiplexing**	8/4
Output format	8 ch sub-LVDS	**Chroma**	Mono (NIR enhanced),RGB Color
Max. Data rate	7.68 Gbps	**Supply voltage**	3.3 V/3.6 V(analog), 1.8 V-3.3 V(IO), 1.2 V(digital)
Power consumption	<1.0 W	**Package**	163 pins LGA (27.1 mm x 17.9 mm)

Package Drawing



GMAX3412

12MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX3412 is a 1.1" optical format CMOS image sensor with 4096 X3072 effective pixels with frame rates up to 128/60 fps in 10/12-bitmode with sub LVDS interface and 30 fps over the alternative 4 MIPD-PHY channels. Based on a high-performance 3.4 um chargedomain global shutter pixel, GMAX3412 achieves a max full wellcapacity of 10 ke- and min dark noise of 1.5 e-, delivering max 68.8dB linear dynamic range. Red Fox technology delivers QE of 75% @540 nm, and a NIR QE of 33% @850 nm. GMAX3412 is housed in176 pin ceramic LGA package, 22.93 mm x 19.39 mm outerdimensions, and pin-compatible to GMAX3405.

Key features and Benefits

· NIR enhanced

· High dynamic range

· Low noise global shutter

Application

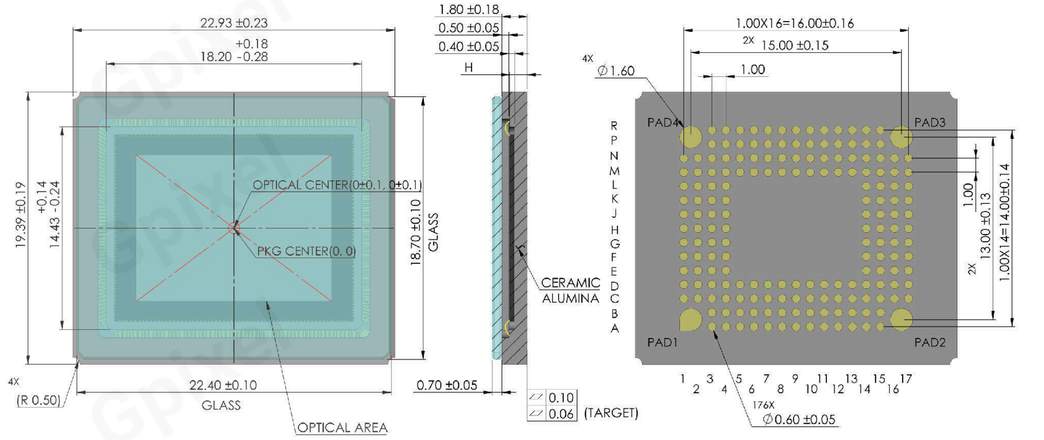
·Automation & Inspection

·Intelligent Transport Systems

Specifications

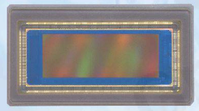
Nr of Active Pixels	4096 (H) x 3072 (V)	**Pixel size**	3.4 µm x 3.4 µm
Optical format	1.1"	**Shutter type**	Global shutter
Photosensive area	14.0 mm x 10.5 mm	**Full well capacity**	10 ke⁻ @ 12-bit and 1x PGA gain
Peak QE	75% @ 540 nm, 33% @ 850 nm	**Temporal noise**	1.5 e⁻ at gain x16,3.6 e⁻ at gain x1
Parasitic Light Sensitivity	-88 dB	**Dark Current**	6.5 e⁻/pixel/s @ 35°C
Angular response	> 15 (80% response)	**Dynamic Range**	68.8 dB
Max. SNR	40.0 dB	**ADC**	10/12 bit
Max Frame rate	128 fps @LVDS @ 10 bit,60 fps @LVDS @ 12 bit	**Channel multiplexing**	16/14/12/10/8/6/4/2/1
Output format	16 ch sub-LVDS ; 4 lanes MIPI	**Chroma**	Mono (NIR enhanced),RGB Color
Max. Data rate	19.2 Gbps @Sub-LVDS,4.8 Gbps @ MIPI	**Supply voltage**	3.3V/3.6V (analog), 1.8V-3.3V (IO), 1.2V (digital)
Power consumption	<1.5 W	**Package**	176 pins LGA (22.93 mm x 19.39 mm)

Package Drawing



GMAX3413

12.7MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX3413 12.7 MP resolution into a 4/3" image format in a wide aspect ratio offering an optimal coverage of the field of view of interest in the intended applications such as Intelligent Traffic System (ITS) and logistics and parcel sorting. GMAX3413 is housed in a 163-pin ceramic LGA package with outer dimensions of 32.7 mm x 17.9 mm and an LGA pad pattern optimized for reliable solder connections.

Key features and Benefits

- Low noise, large size global shutter pixel provided optimal SNR
- LED flicker mitigation
- Vertical and horizontal ROI
- Excellent PLS and angular response
- Wide aspect ratio
- Multiple region HDR
- Vertical and horizontal image flipping
- On-chip color offset calibration

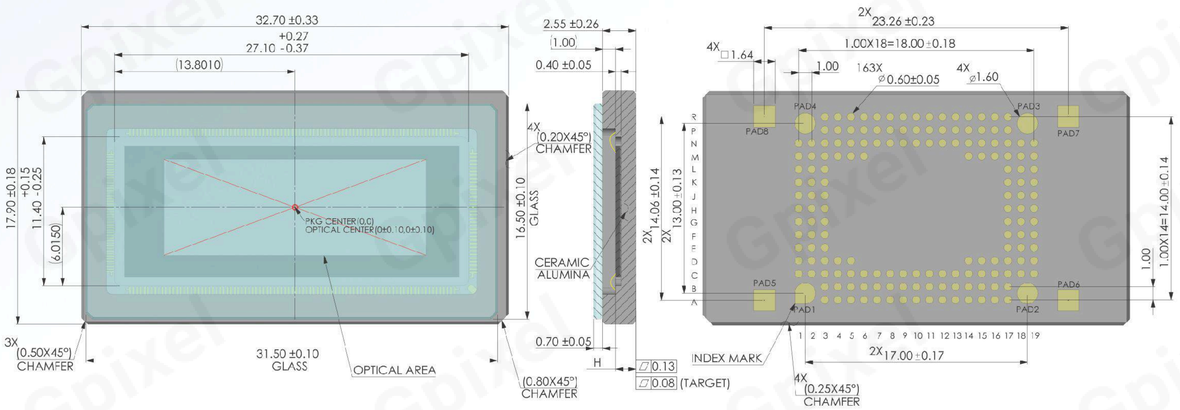
Application

·Automation & Inspection ·Intelligent Transport Systems

Specifications

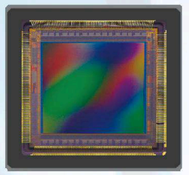
Nr of Active Pixels	5900 (H) x 2160 (V)	**Pixel size**	3.4 µm x 3.4 µm
Optical format	4/3"	**Shutter type**	Global shutter
Photosensive area	20.1 mm x 7.3 mm	**Full well capacity**	8.6 ke⁻
Peak QE	62.7% @ 540 nm	**Temporal noise**	2.31 e⁻
Parasitic Light Sensitivity	< -92.0 dB	**Dark Current**	81 e⁻/pixel/s @ 35°C
Angular response	> 15 (80% response)	**Dynamic Range**	71.4 dB
Max. SNR	39.3 dB	**ADC**	12 bit
Max Frame rate	32 fps	**Channel multiplexing**	8/4
Output format	8 ch sub-LVDS	**Chroma**	Mono (NIR enhanced),RGB Color
Max. Data rate	7.68 Gbps	**Supply voltage**	3.3 V/3.6 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<1.2 W	**Package**	163 pins LGA (32.7 mm x 17.9 mm)

Package Drawing



GMAX2518

18MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX2518 has an optical format of 1" and features 18 MP (4508 × 4096) Global Shutter pixels based on the proven GMAX 2.5 µm architecture, operating with true correlated double sampling (CDS) for low read noise and high dynamic range. In addition, the dual light pipe technology provides excellent PLS and angular response, with 32 pairs of sub-LVDS each run at 960 MHz, the sensor output with maximum 30.72 Gbps data, achieving maximum frame rate of 139 fps in 10 bit output and 64 fps in 12 bit output.The sensor integrates an on-chip sequencer, programmable through SPI, and is designed to be fully pin compatible with GMAX0505, GMAX2509 and GMAX2505 to significantly shorten time to market for camera manufactures.

Key features and Benefits

- High resolution GS in 1" optical format
- Pin-compatible with GMAX0505/2509/2505
- Low noise global shutter

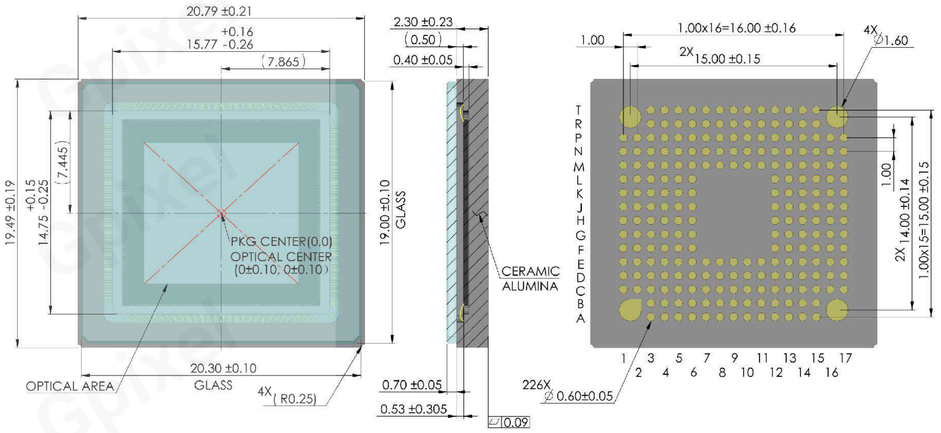
Application

·Automation & Inspection ·Logistic & Positioning ·Metrology

Specifications

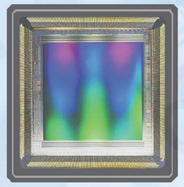
Nr of Active Pixels	4508 (H) x 4096 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	1"	**Shutter type**	Global shutter
Photosensive area	11.3 mm x 10.2 mm	**Full well capacity**	8.0 ke⁻
Peak QE	64.0% @ 520 nm	**Temporal noise**	1.7 e⁻
Parasitic Light Sensitivity	-80 dB	**Dark Current**	6.5 e⁻/pixel/s @ 45°C
Angular response	> 12 (80% response)	**Dynamic Range**	66.9 dB @ 12 bit,61.9 dB @ 10 bit
Max. SNR	39 dB	**ADC**	10/12 bit
Max Frame rate	139 fps @ 10 bit	**Channel multiplexing**	32/16/12/8/4/2
Output format	32 ch sub-LVDS	**Chroma**	Mono & RGB Color
Max. Data rate	30.72 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<1.2 W @ 12 bit,<1.2 W @ 10 bit	**Package**	226 pins LGA (20.8 mm x 19.5 mm)

Package Drawing



GMAX0505

26MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX0505 designed with the world's smallest 2.5 μm charge domain global shutter pixel, offers the highest resolution of 25 Megapixels within 1.1" optical format. The superior performance and the cost-effective packaging of GMAX0505 offer camera manufactures great advantage over various applications, including machine vision, high resolution industrial inspection, ITS and surveillance.GMAX0505RF is processed with Red Fox Technology for NIR sensitivity enhancement. GMAX0505 is pin-compatible with GMAX2505, GMAX2509 and GMAX2518,All four sensors are designed with the same 2.5 μm global shutter pixel architecture and same sequencer operation, allowing reduced system costs and R&D cost for customers.

Key features and Benefits

· 2.5 μm Global Shutter pixel
· Optimized tungsten shielding structure
· High speed and Good PLS
· High resolution GS in 1.1"optical format
· NIR enhanced – Red Fox
· Pin-compatible with GMAX2505, GMAX2509 and GMAX2518

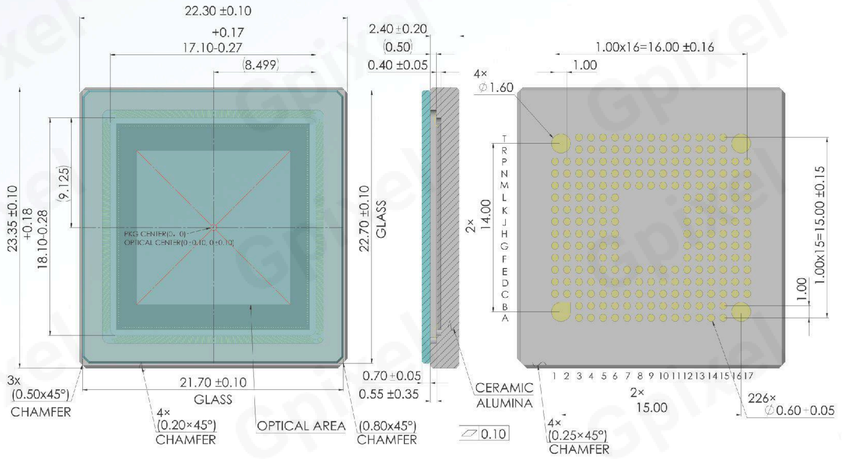
Application

·Automation & Inspection ·Logistic & Positioning ·Metrology

Specifications

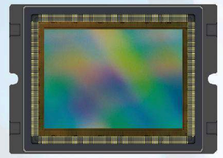
Nr of Active Pixels	5120 (H) x 5120 (V)	**Pixel size**	2.5 μm x 2.5 μm
Optical format	1.1"	**Shutter type**	Global shutter
Photosensive area	12.8 mm x12.8 mm	**Full well capacity**	6.5 ke⁻
Peak QE	65.5% @ 500 nm	**Temporal noise**	1.6 e⁻
Parasitic Light Sensitivity	-80 dB	**Dark Current**	1.0 e⁻/pixel/s @ 30°C
Angular response	> 13 (80% response)	**Dynamic Range**	65.8 dB @ 12 bit,61.4 dB @ 10 bit
Max. SNR	38.1 dB	**ADC**	10/12 bit
Max Frame rate	150 fps @ 10 bit	**Channel multiplexing**	48/24/16/12/8/6/4/2
Output format	48 ch sub-LVDS	**Chroma**	Mono,Mono (NIR enhanced), RGB Color
Max. Data rate	46.08 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<1.1W @ 12bit,<1.5 W @ 10 bit	**Package**	226 pins LGA (20.8 mm x 19.5 mm)

Package Drawing



GMAX4651

51MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX4651 is a 51MP delivers 8k video at 30 fps in a 35 mm optical format, making it ideal for applications in broadcast imaging, surveillance, aerial mapping and biometrics. It's large 4.6 μm pixel easily provides 65.5 dB of dynamic range, excellent sensitivity with a peak QE of 67%, and exceptional PLS at <-92 dB. At full resolution and full speed, the power dissipated is less than 2.8 W. 12bit data is delivered via 24 pairs of sLVDS channels, and channel multiplexing allows operation of the sensor through 14, 8, 6 or 4 channels. The sensor is assembled in a 238-pin PGA package for excellent reliability and heat dissipation. Available in both monochrome and Bayer versions, the GMAX4651 can provide excellent 8k video or high resolution stills for traditional and non-traditional video and photography applications.traditional and non-traditional video and photography applications.

Key features and Benefits

· High resolution in standard optical format
· Large, high sensitive pixels
· Low noise global shutter

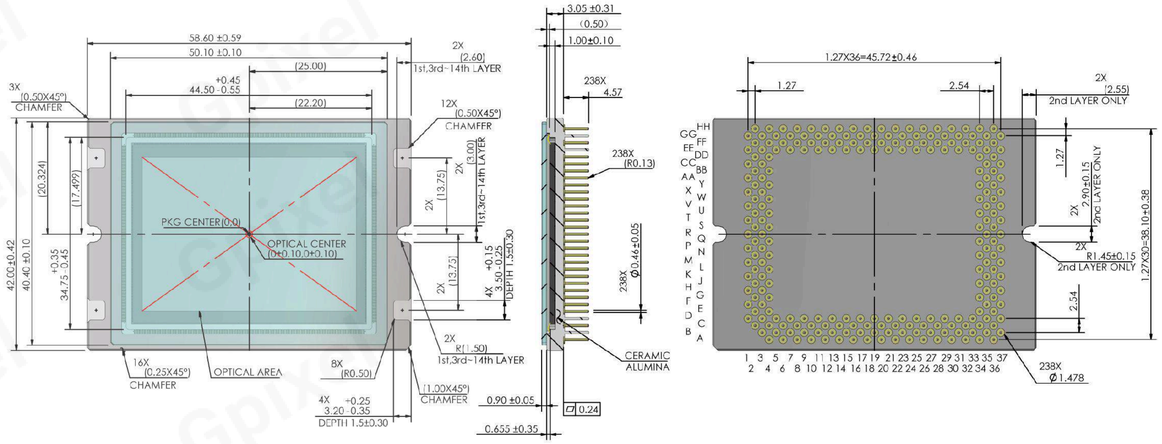
Application

·Automation & Inspection

Specifications

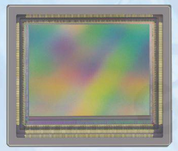
Nr of Active Pixels	8424 (H) x 6032 (V)	**Pixel size**	4.6 μm x 4.6 μm
Optical format	35mm Full Frame	**Shutter type**	Global shutter
Photosensive area	38.8 mm x 27.8 mm	**Full well capacity**	18 ke⁻
Peak QE	67.1% @ 510 nm	**Temporal noise**	7.6 e⁻
Parasitic Light Sensitivity	-92 dB	**Dark Current**	6 e⁻/pixel/s @ 45°C
Angular response	> 15 (80% response)	**Dynamic Range**	65.5 dB
Max. SNR	42.5 dB	**ADC**	12 bit
Max Frame rate	30 fps @ 12 bit	**Channel multiplexing**	24/14/8/6/4
Output format	24 ch sub-LVDS	**Chroma**	Mono, RGB Color
Max. Data rate	20.74 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<2.8 W	**Package**	238 pins PGA (58.6 mm x 42.0 mm)

Package Drawing



GMAX3265

65MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX3265 is a 65MP sized to fit comfortably behind a 35 mm lens, making it a cost-effective solution for applications ranging from high end surveillance to high resolution inspection. Using advanced processing technology the 3.2 µm global shutter pixel achieves 65% peak QE, excellent angular response, and a parasitic light sensitivity less than -83.5 dB.The sensor supports both 10bit operation for a maximum full-resolution frame rate of 71 fps, and 12 bit operation for a dynamic range over 66 dB at 31 fps and <2.1 W. The sensor is available in both monochrome and Bayer versions to support use in a variety of applications including machine vision, QA inspection, surveillance, biometrics, document imaging and flat panel inspection.

Key features and Benefits

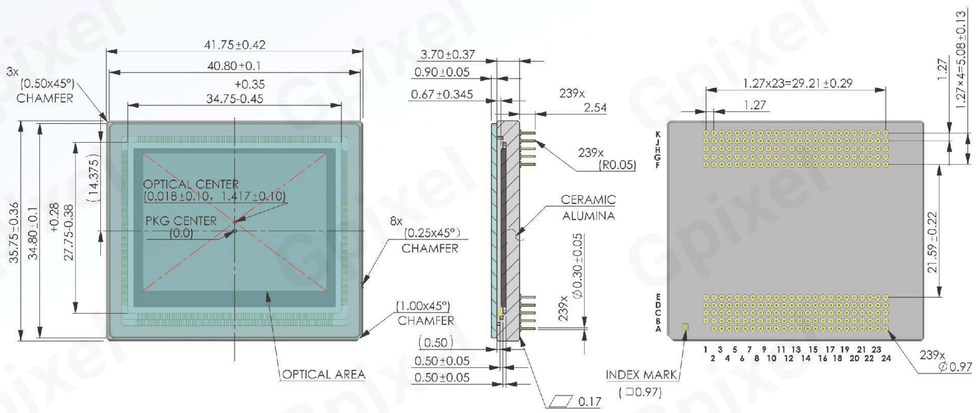
· High resolution in compact optical format
· Low noise global shutter
· High speed and good PLS

Application

·Automation & Inspection

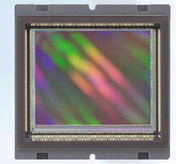
Specifications			
Nr of Active Pixels	9344 (H) x 7000 (V)	**Pixel size**	3.2 µm x 3.2 µm
Optical format	2.3"	**Shutter type**	Global shutter
Photosensive area	29.9 mm x 22.4 mm	**Full well capacity**	10.9 ke⁻
Peak QE	65.3% @ 500 nm	**Temporal noise**	1.9 e⁻
Parasitic Light Sensitivity	-83.5 dB	**Dark Current**	5.3 e⁻/pixel/s @ 40°C
Angular response	> 15 (80% response)	**Dynamic Range**	66.0 dB @ 12 bit, 62.3 dB @ 10 bit
Max. SNR	40.3 dB	**ADC**	10/12 bit
Max Frame rate	71 fps @10 bit	**Channel multiplexing**	56/28/14/8/7/4/2/1
Output format	56 ch sub-LVDS	**Chroma**	Mono, RGB Color
Max. Data rate	50.40 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V-3.3 V(IO), 1.3 V(digital)
Power consumption	<2.1 W @ 12 bit,<2.3 W @ 10 bit	**Package**	239 pins uPGA (41.8 mm x 35.8 mm)

Package Drawing



GMAX32103

103MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX32103 is a 103MP medium sized ultral high resolution image sensor using advanced processing technology the 3.2 µm global shutter pixel achieves 66.9% peak QE @ 500nm, excellent angular response, and a parasitic light sensitivity -83.9 dB. The sensor supports 12 bit operation for a maximum full-resolution frame rate of 24 fps. Channel multiplexing of the 52 pairs of sub-LVDS channels allows for optimization between speed and dynamic range to suit the application. The sensor is available in both monochrome and Bayer versions to support use in a variety of applications including machine vision, QA inspection, surveillance, biometrics, document imaging and flat panel inspection.

Key features and Benefits

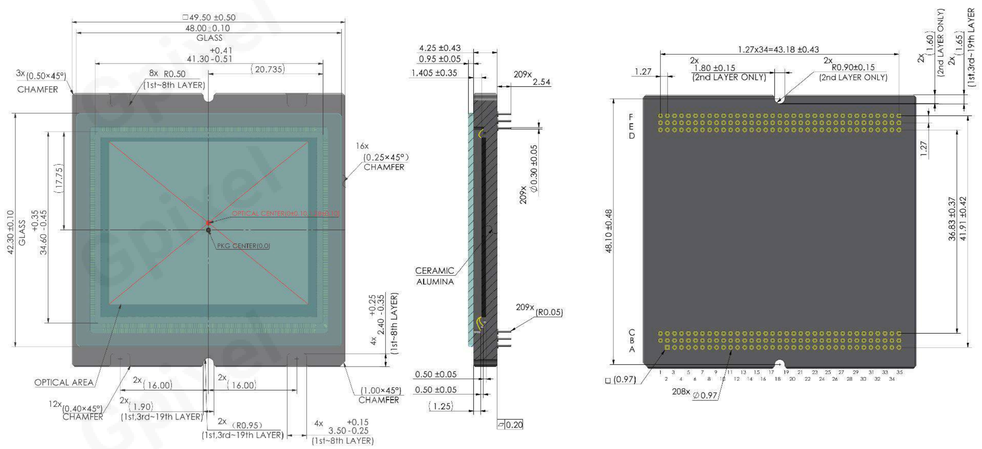
· High resolution in compact optical format
· High data throughput
· High speed and good PLS

Application

·Automation & Inspection

Specifications			
Nr of Active Pixels	11276 (H) x 9200 (V)	**Pixel size**	3.2 µm x 3.2 µm
Optical format	2.9"	**Shutter type**	Global shutter
Photosensive area	36.1 mm x 29.4 mm	**Full well capacity**	9 ke⁻
Peak QE	66.9% @ 500 nm	**Temporal noise**	2.8 e⁻
Parasitic Light Sensitivity	-83.5 dB	**Dark Current**	1.4 e⁻/pixel/s @ 30°C
Angular response	> 15 (80% response)	**Dynamic Range**	66.4 dB
Max. SNR	39.5 dB	**ADC**	12 bit
Max Frame rate	24 fps @12 bit	**Channel multiplexing**	52/26/18/14/10/8/6
Output format	52 ch sub-LVDS	**Chroma**	Mono, RGB Color
Max. Data rate	49.92 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 1.8 V – 3.3 V(IO), 1.2 V(digital)
Power consumption	<2.5 W	**Package**	209 pins uPGA (49.5 mm x 42.3 mm)

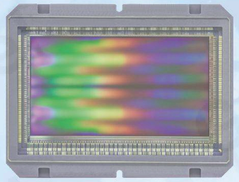
Package Drawing



Gpixel

GMAX32152

152MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX32152 Featured with the latest generation 3.2 μm charge-domain global shutter pixel and 152 MP resolution, GMAX32152 is the leading-edge image sensor offering a large image plane of 60.6 mm diagonal which ideally for high resolution industrial inspection applications. The state of art pixel operates with true correlated double sampling (CDS), allowing low read noise and high dynamic range. In addition, the light pipe technology provides excellent PLS and angular response.GMAX32152 is assembled using 183-pin micro-PGA ceramic package for reliability and good heat dissipation.

Key features and Benefits

· Highest resolution global shutter
· Low noise global shutter
· 1.8:1 wide aspect ratio

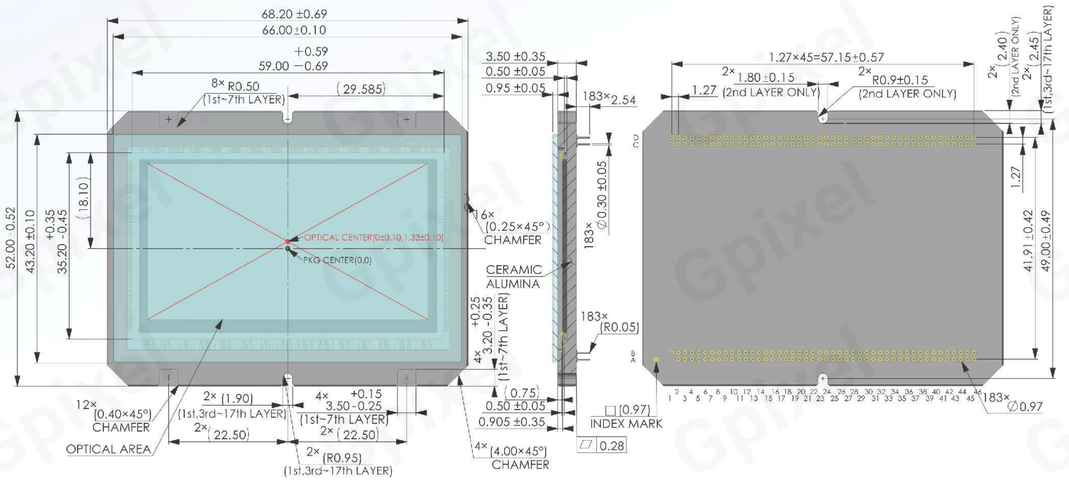
Application

·Automation & Inspection
·Metrology

Specifications

Nr of Active Pixels	16556 (H) x 9200 (V)	**Pixel size**	3.2 μm x 3.2 μm
Optical format	3.7"	**Shutter type**	Global shutter
Photosensive area	53.0 mm x 29.4 mm	**Full well capacity**	9.3 ke$^-$
Peak QE	66.9% @ 500 nm	**Temporal noise**	4.0 e$^-$
Parasitic Light Sensitivity	-83.5 dB	**Dark Current**	1.4 e$^-$/pixel/s @ 30°C
Angular response	> 15 (80% response)	**Dynamic Range**	67.3 dB
Max. SNR	39.5 dB	**ADC**	12 bit
Max Frame rate	16 fps @ 12 bit	**Channel multiplexing**	38/20/14/11/8/5
Output format	38 ch sub-LVDS	**Chroma**	Mono, RGB Color
Max. Data rate	36.48 Gbps	**Supply voltage**	3.3 V/1.3 V(analog), 2.5 V – 3.3 V(IO), 1.2 V(digital)
Power consumption	<2.8 W	**Package**	183 pins μPGA (68.2 mm x 52.0 mm)

Package Drawing



GMAX | GSPRINT | GSENSE | GLUX | GTOF | GCINE | GL

Area Scan CMOS Image Sensor

GSPRINT family products are ultra-high-speed, global shutter image sensors developed by Gpixel for high-speed imaging. The series includes 2.5MP GSPRINT4502, 10MP GSPRINT4510 and 21MP GSPRINT4521. Similar architectures within the family make it straightforward for camera makers to offer a full portfolio of high-speed cameras targeting diverse applications.

GSPRINT4502 GSPRINT4510 GSPRINT4521

Product Family Features

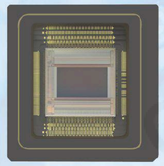
- Global Shutter
- Ultra-high speed
- 2.5MP-21MP resolution
- Low noise

Applications

- Automation & Inspection
- Traffic & Transportation
- Video Broadcasting
- Medical Imaging

GSPRINT4502

2.4MP GLOBAL SHUTTER HIGH SPEED IMAGE SENSOR



GSPRINT4502 is a 2 Megapixel (2048 x 1216) 2/3 sized (10.7 mm) high speed, global shutter image sensor designed with the latest 4.5 µm charge domain global shutter pixel. It achieves more than 30k e^- FWC, less than 4 e^- rms read noise and > 68 dB dynamic range, optionally to be increased with multi-slope HDR mode.With on-chip charge binning, FWC can be further increased to > 120 ke^- and frame rate is quadrupled. GSPRINT4502 consists of 64 pairs sub-LVDS channels running at 1.2Gbps which delivers a stunning 3300 fps at 8 bit per pixel and full resolution and over 10000 fps with binning mode. These unique features make it an ideal solution for demanding imaging in applications such as 3D laser profiling, industrial inspection, motion analysis and high speed imaging.

Key features and Benefits

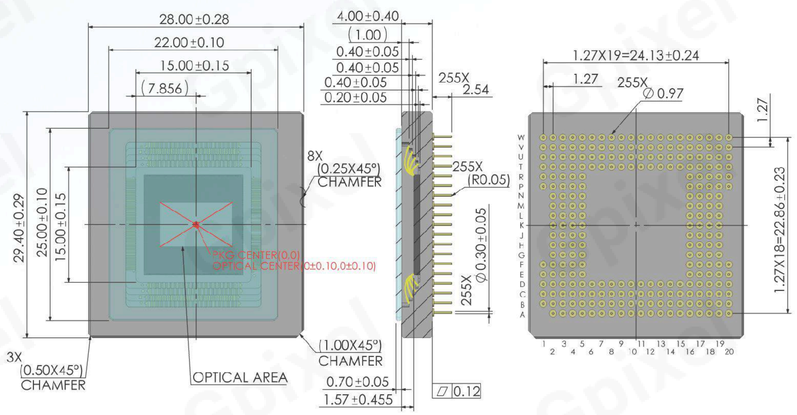
· High Frame Rate · Low noise Global Shutter · Multi-slope HDR

Application

·Automation & Inspection ·Cinematography ·High Speed Imaging

Specifications			
Nr of Active Pixels	2048 (H) x 1216 (V)	**Pixel size**	4.5 µm x 4.5 µm
Optical format	2/3"	**Shutter type**	Global shutter
Photosensive area	9.21 mm x 5.47 mm	**Full well capacity**	>30 ke^-
Peak QE	65.7% @ 515 nm	**Temporal noise**	3.8 e^-
Parasitic Light Sensitivity	-84.6 dB	**Dark Current**	21 e^-/pixel/s @ 60°C
Angular response	20°(80% response)	**Dynamic Range**	68.2 dB @ 12 bit
Max. SNR	44.8 dB	**ADC**	8/10/12 bit
Max Frame rate	3462 fps @ 8 bit, 1782 fps @ 10 bit, 852 fps @ 12 bit	**Channel multiplexing**	160/156/152/.../4 (any multiple of 4)
Output format	64 ch sub-LVDS	**Chroma**	Mono,RGB Color
Max. Data rate	76.8 Gbps	**Supply voltage**	3.3 V(analog), 1.8 V(I/O), 1.2 V(digital)
Power consumption	2.5 W	**Package**	255 pins µPGA (28.0 mm x 29.4 mm)

Package Drawing



GSPRINT4510

10MP GLOBAL SHUTTER HIGH SPEED IMAGE SENSOR

GSPRINT4510 is a 10MP (4608 x 2176) 4/3" (22.9 mm) high speed image sensor designed with the latest 4.5 µm charge domain global shutter pixel. It achieves more than 30 ke^- charge capacity and less than 3 e^- rms read noise. Using an advanced 65 nm CIS process with light pipe technology, the sensor achieves >67% QE and more than 1/40,000 shutter efficiency. With on-chip charge binning, full well capacity can be further increased and frame rate is almost quadrupled.This version of the sensor incorporates micro lenses on top of the pixels and a sealed glass lid making GSPRINT4510 the ultimate choice for many applications such as 4/3"(Micro Four Thirds) format global shutter cameras in slow motion capture or drone-mounted videography.

Key features and Benefits

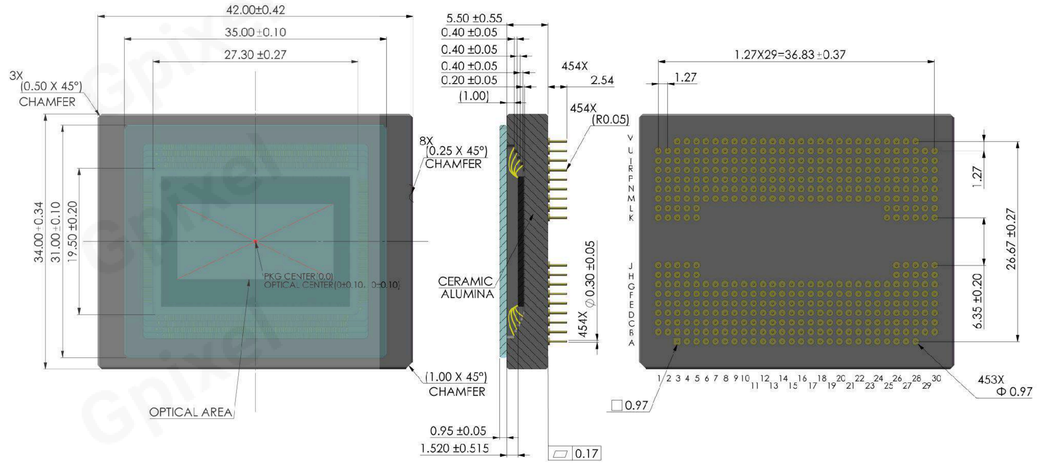
· High Frame Rate · Low noise Global Shutter · Multi-slope HDR

Application

·Automation & Inspection ·Cinematography ·High Speed Imaging

Specifications			
Nr of Active Pixels	4608 (H) x 2176 (V)	**Pixel size**	4.5 µm x 4.5 µm
Optical format	4/3" (MFT)	**Shutter type**	Global shutter
Photosensive area	20.7 mm x 9.79 mm	**Full well capacity**	>30 ke^-
Peak QE	>67% @ 550 nm	**Temporal noise**	4 e^-
Parasitic Light Sensitivity	<-86 dB	**Dark Current**	11.4 e^-/pixel/s @ 50°C
Angular response	20°(80% response)	**Dynamic Range**	68.2 dB @ 12 bit
Max. SNR	44.7 dB	**ADC**	8/10/12 bit
Max Frame rate	1920 fps @ 8 bit, 1000 fps @ 10 bit, 480 fps @12 bit	**Channel multiplexing**	160/156/152/.../4 (any multiple of 4)
Output format	144 ch sub-LVDS	**Chroma**	Mono,RGB Color
Max. Data rate	172.8 Gbps	**Supply voltage**	3.3 V(analog), 1.8 V(I/O), 1.2 V(digital)
Power consumption	2.5 W	**Package**	454 pins µPGA (42.0 mm x 34.0 mm)

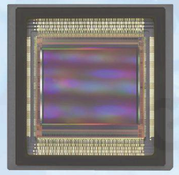
Package Drawing



Gpixel

GSPRINT4521

21MP GLOBAL SHUTTER HIGH SPEED IMAGE SENSOR



GSPRINT4521 is a 21 Megapixel (5120 x 4096) APS sized (29.5 mm diameter) high speed, global shutter image sensor designed with the latest 4.5 µm charge domain global shutter pixel. It achieves 32 ke$^-$, less than 3 e$^-$rms read noise and >69 dB dynamic range, optionally increased to 81 dB with a dual gain HDR mode. Its state-of-the-art 65 nm CIS process allows the sensor to use on-chip charge binning, further increasing FWC and almost quadrupling frame rate.GSPRINT4521 will be offered in two speed variants. These unique features make it an ideal solution for demanding imaging in high-end applications such as high speed 4K video, industrial inspection, motion analysis and life science imaging.

Key features and Benefits

· High Frame Rate

· Low noise Global Shutter

· dual gain HDR mode

Application

·Automation & Inspection

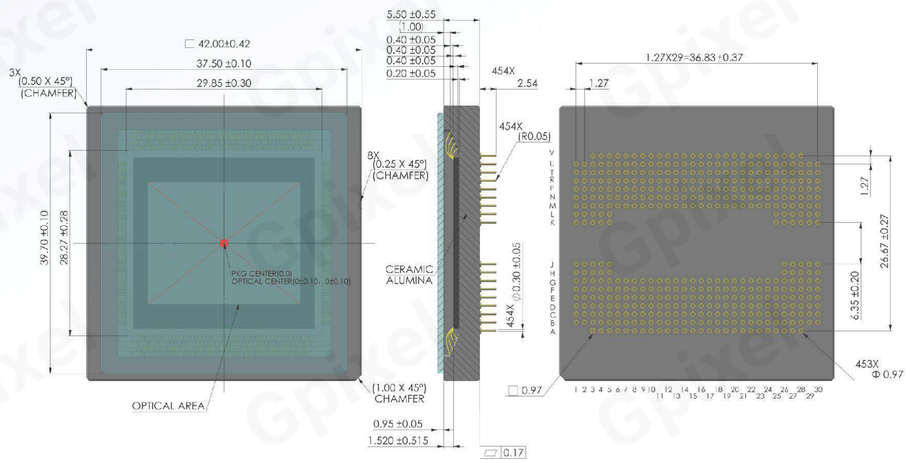
·Cinematography

·High Speed Imaging

Specifications

Nr of Active Pixels	5120 (H) x 4096 (V)	**Pixel size**	4.5 µm x 4.5 µm
Optical format	1.84" (APS-C)	**Shutter type**	Global shutter
Photosensive area	23.04 mm x 18.43 mm	**Full well capacity**	32 ke$^-$
Peak QE	>63% @ 500 nm	**Temporal noise**	3.5 e$^-$
Parasitic Light Sensitivity	<-86 dB	**Dark Current**	11.4 e$^-$/pixel/s @ 50°C
Angular response	17°(80% response)	**Dynamic Range**	68.2 dB @ 12 bit
Max. SNR	45 dB	**ADC**	8/10/12 bit
Max Frame rate	1000 fps @ 8 bit	**Channel multiplexing**	160/156/152/.../4 (any multiple of 4)
Output format	160 ch sub-LVDS	**Chroma**	Mono,RGB Color
Max. Data rate	192 Gbps	**Supply voltage**	3.3 V(analog), 1.8 V(I/O), 1.2 V(digital)
Power consumption	6 W	**Package**	454 pins µPGA (42.0 mm x 42.0 mm)

Package Drawing



Gpixel

GMAX | GSPRINT | GSENSE | GLUX | GTOF | GCINE | GL

Area Scan CMOS Image Sensor

The GSENSE series is a world leading scientific CMOS image sensor family, designed with correlated multiple sampling for extreme low noise, true HDR for high dynamic range and optional backside illumination technology for quantum efficiency of up to 95%. Primary applications include scientific imaging, medical imaging, spectroscopy, fluorescence imaging, astronomy, high energy physics, and high-end surveillance.

GSENSE2020
GSENSE400
GSENSE4040
GSENSE6060
GSENSE3243BSI
GSENSE1081BSI
GSENSE2020BSI
GSENSE400BSI
GSENSE4040BSI
GSENSE6060BSI
GSENSE2011

Product Family Features

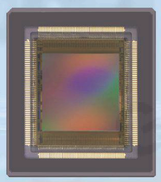
- Large Format
- High Dynamic
- BSI
- Low Noise

Applications

- Life Sciences
- Microscopy
- Spectroscopy
- Astronomy
- X-Ray

GSENSE2020

4MP SCIENTIFIC CMOS IMAGE SENSOR



GSENSE2020 is a 4MP resolution scientific CMOS image sensor, capable of operating with either global or rolling shutter. Featured with six transistor (6T) pixel design on a 6.5 μm pitch, the sensor has a very low readout noise of 2.1 e^- in rolling shutter HDR mode with maximum frame rate of 47 fps / 370 fps. Sensor's HDR mode is based on dual gain HDR, meaning sensor outputs two images with Low gain setting and High gain setting after each exposure, combining the two images off chip with HDR construction algorithm allow up to 87 dB dynamic range.

Key features and Benefits

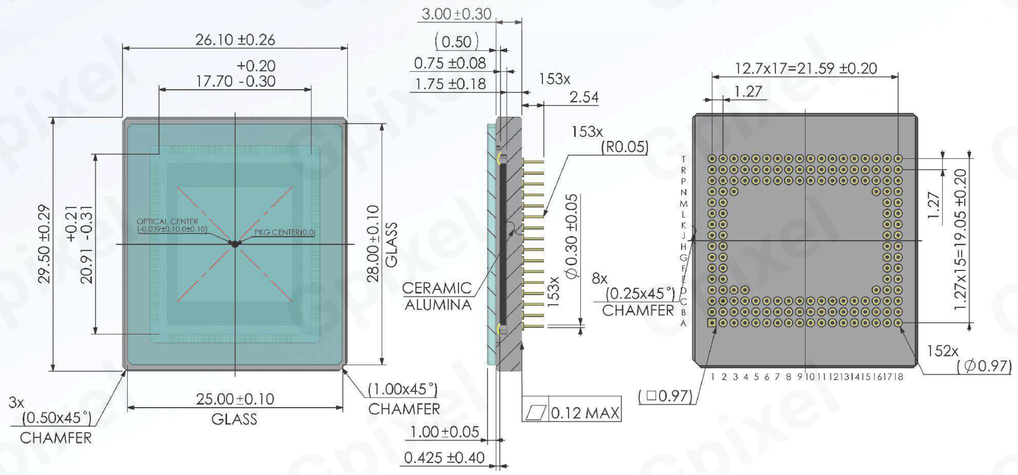
· Scientific CMOS
· Peak QE of 72%
· Low noise, low power for long expsoure modes

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

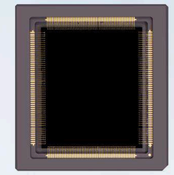
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	6.5 μm x 6.5 μm
Optical format	1.2"	**Shutter type**	Rolling & Global shutter
Photosensive area	13.3 mm x 13.3 mm	**Input clock rate**	50 MHz
Peak QE	72% @ 595 nm	**Full well capacity**	45 ke^-
Dark Current	13 e^-/pixel/s @ 30°C	**Temporal noise**	2.1 e^-
Max Frame rate	47 fps @ RS HDR,370 fps @ GS DDS	**Dynamic Range**	86.6 dB
Output format	32 ch LVDS	**Max. Data rate**	4.8 Gbps
Chroma	Mono,RGB Color	**Power consumption**	811 mW
Supply voltage	3.3 V(analog), 1.8 V(I/O), 1.2 V(digital)	**Package**	153 pins μPGA (26.1 mm x 29.5 mm)

Package Drawing



GSENSE2020BSI

4MP SCIENTIFIC BSI CMOS IMAGE SENSOR



GSENSE2020 is a backside illuminated (BSI) scientific CMOS image sensor, with 4MP resolution and 6.5 μm pixel size. With six-transistor (6T) pixel architecture, GSENSE2020BSI features readout noise of 1.6 e^-, full well of 55 ke^-, as well as peak QE of 95%. In addition, the sensor supports correlated multiple sampling (CMS), the read noise can be further reduced to 1.2 e^- with 2-CMS operation. In addition, GSENSE2020BSI is pin-compatible with GSENSE2020 and GSENSE2011, allowing easy hardware integration with minimized development, and fast time-to-market.

Key features and Benefits

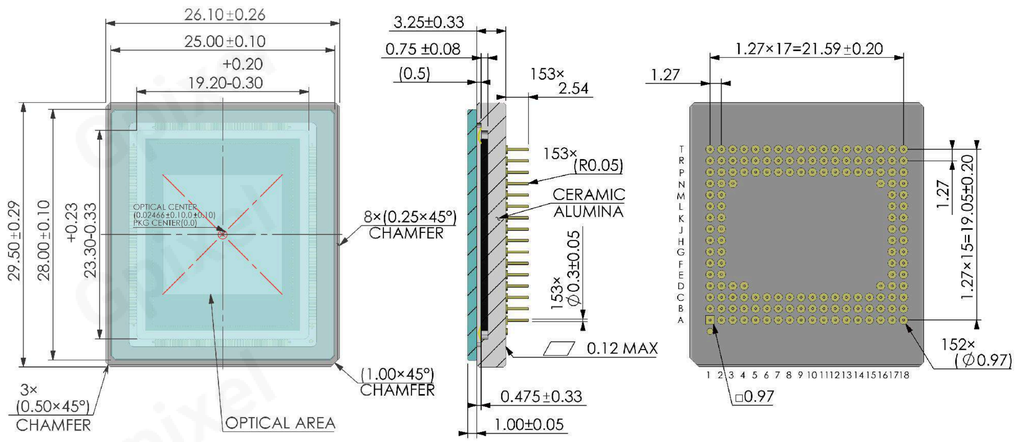
· Scientific CMOS
· Peak QE of 95%
· Low noise, low power for long expsoure modes

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

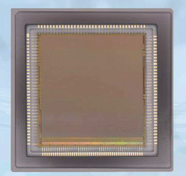
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	6.5 μm x 6.5μm
Optical format	1.2"	**Shutter type**	Rolling shutter
Photosensive area	13.3 mm x 13.3 mm	**Input clock rate**	600 MHz
Peak QE	95% @ 560 nm	**Full well capacity**	55 ke^-
Dark Current	0.07 e^-/pixel/s @ 30 °C	**Temporal noise**	1.2 e^-
Max Frame rate	43 fps @ 12 bit,74 fps @ 11 bit	**Dynamic Range**	90.5 dB
Output format	8 ch LVDS @ 12 bit,16 ch LVDS @ 11 bit	**Max. Data rate**	9.6 Gbps @ 11 bit
Chroma	Mono	**Power consumption**	<1.2 W
Supply voltage	3.5 V(analog), 2.0 V(digital)	**Package**	153 pins μPGA (26.1 mm x 29.5 mm)

Package Drawing



GSENSE400

4MP SCIENTIFIC CMOS IMAGE SENSOR



GSENSE400 is a 4 Megapixels resolution CMOS image sensor using 11 μm pitch high dynamic range pixel. The sensor operates in electronic rolling shutter and features an extremely low temporal noise of 1.5 e^- The sensor peak QE is around 58% without μlens. In HDR mode, the sensor achieves a linear dynamic range of more than 95.6 dB. GSENSE400 integrates a 12 bit ADC, a temperature sensor, a PLL and SPI control on-chip. The power consumption of the image sensor running at full speed is less than 600 mW.

Key features and Benefits

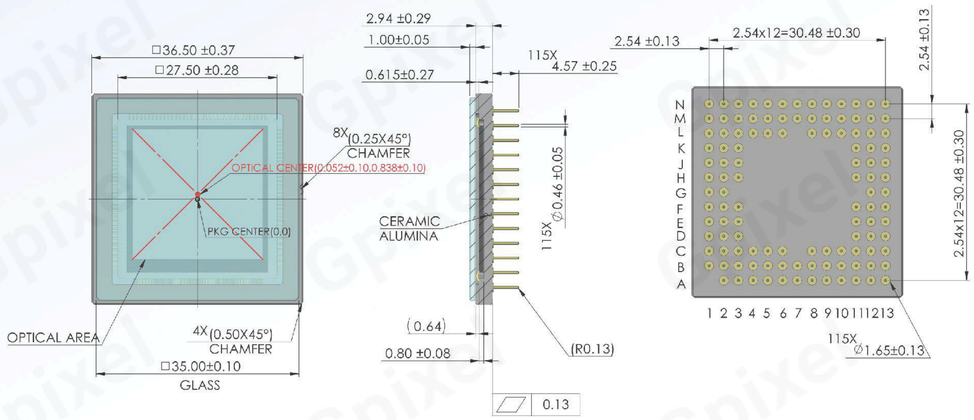
· Peak QE of 58.2%
· Low noise
· High dynamic range

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

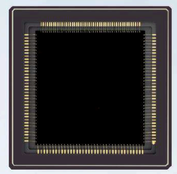
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	11 μm x 11μm
Optical format	2"	**Shutter type**	Rolling shutter
Photosensive area	22.5 mm x 22.5 mm	**Input clock rate**	20 MHz-30MHz
Peak QE	58% @ 600nm	**Full well capacity**	90 ke^-
Dark Current	0.15 e^-/pixel/s @ -20°C	**Temporal noise**	1.5 e^-
Max Frame rate	48 fps @ STD	**Dynamic Range**	95 dB
Output format	8 ch LVDS	**Max. Data rate**	2.4 Gbps
Chroma	Mono	**Power consumption**	<600 mW
Supply voltage	3.3 V(analog), 1.8 V(I/O)	**Package**	115 pins PGA (36.5 mm x 36.5 mm)

Package Drawing



GSENSE400BSI

4MP SCIENTIFIC BSI CMOS IMAGE SENSOR



GSENSE400BSI is a high-performance 2k x 2k image sensor designed for the most demanding scientific applications. It's generous 11 μm rolling shutter pixel combined with the sensor's dual gain HDR functionality deliver over 94 dB of dynamic range while maintaining a frame rate of 24 fps. If higher frame rates are required, 48 fps can be sustained in standard imaging mode with a dynamic range of 65 dB. The 22.5 mm x 22.5 mm square active imaging area is ideally sized for microscopy applications. Whether used to capture long exposures of faraway nebulae or for high-throughput imaging of biological samples, the GSENSE400BSI is the scientific industry's high-performance imaging workhorse.

Key features and Benefits

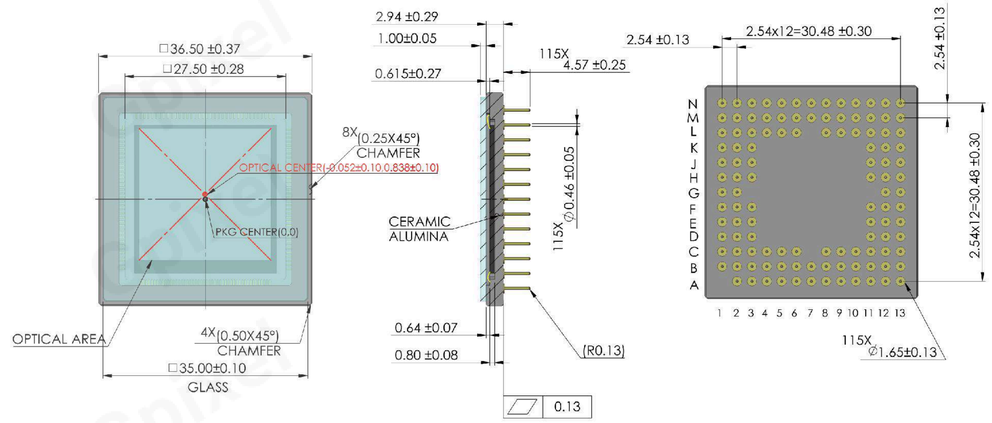
· Backside Illumination scientific CMOS
· Peak QE of 95%
· Low noise, low power for long exposure modes

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

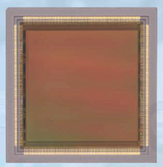
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	11 μm x 11 μm
Optical format	2"	**Shutter type**	Rolling shutter
Photosensive area	22.5 mm x 22.5 mm	**Input clock rate**	25 MHz
Peak QE	95% @ 570 nm	**Full well capacity**	91 ke^-
Dark Current	0.27 e^-/pixel/s @ -40°C	**Temporal noise**	1.6 e^-
Max Frame rate	48 fps @ STD	**Dynamic Range**	94 dB @ HDR
Output format	8 ch LVDS	**Max. Data rate**	2.4 Gbps
Chroma	Mono	**Power consumption**	<650 mW
Supply voltage	3.3 V(analog), 1.8 V(digital)	**Package**	115 pins PGA (36.5 mm x 36.5 mm)

Package Drawing



GSENSE4040

16.8MP SCIENTIFIC CMOS IMAGE SENSOR



GSENSE4040 is a 16.8Mega pixel resolution CMOS image sensor. Featured with five transistor (5T) HDR pixel design on a 9 μm pitch, the sensor could achieve 3.7 e^- dark noise and 74 ke^- FWC simultaneously in HDR mode. It supports 2 x 2 charge binning mode in which x 4 frame rate is achieved. GSENSE4040 is offered in two variations: CMN and CMT. CMN is a monochrome sensor without microlens array and protected by a removable glass lid, which is ideal for X-ray imaging, charged particle detection, and micro-CT application; while CMT is a monochrome sensor with microlens array and sealed with D263T lids with anti-reflective coating on both sides, ideal for medical imaging and astronomy applications.

Key features and Benefits

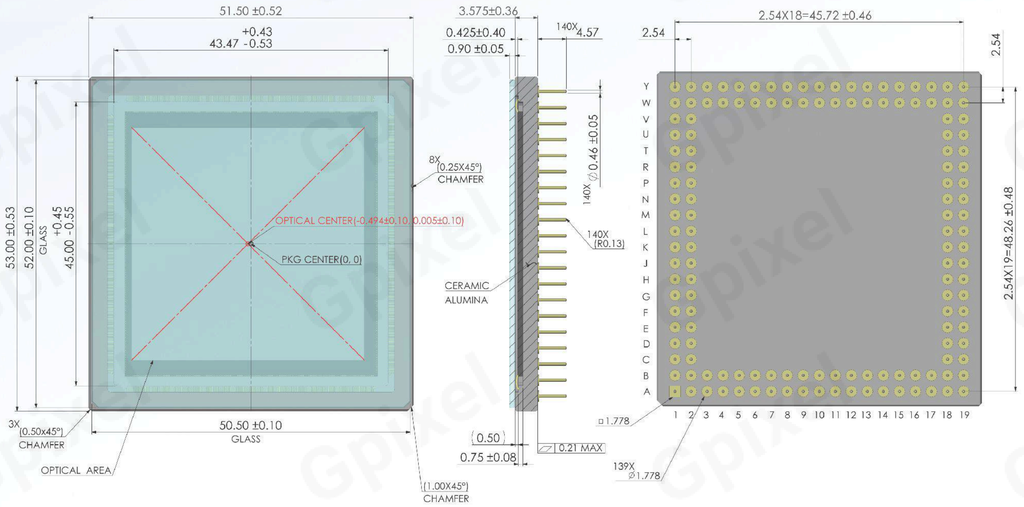
· Peak QE of 74%
· Large format
· High dynamic range

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

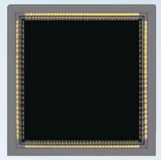
Specifications			
Nr of Active Pixels	4096 (H) x 4096 (V)	**Pixel size**	9 μm x 9 μm
Optical format	3.3"	**Shutter type**	Rolling shutter
Photosensive area	36.864 mm x 36.864 mm	**Input clock rate**	50 MHz
Peak QE	74% @ 600nm	**Full well capacity**	>70 ke^-
Dark Current	12.2 e^-/pixel/s @ 25°C	**Temporal noise**	2.3 e^-
Max Frame rate	24 fps	**Dynamic Range**	86 dB
Output format	18 ch LVDS	**Max. Data rate**	10.8 Gbps
Chroma	Mono	**Power consumption**	<1.4 W
Supply voltage	3.3 V(analog), 1.8 V(digital)	**Package**	140 pins PGA (51.5 mm x 53.0 mm)

Package Drawing



GSENSE4040BSI

16.8MP SCIENTIFIC BSI CMOS IMAGE SENSOR



GSENSE4040BSI is a BSI CMOS image sensor of 16.8MP (4096 x 4096) resolution with 9 μm × 9 μm pixel size, and a photosensitive area of 36.8 mm x 36.8 mm (52 mm diagonal).Using dual gain HDR operation mode, 85 dB is achieved with 39k e^- full well capacity and 2.3 e^- readout noise. 18 pairs of LVDS channels running at 600 MHz per channel support full-resolution imaging at a frame rate of 24 fps.GSENSE4040BSI is assembled in 140-pin PGA ceramic package with a removable glass lid. This sensor is pin compatible with GSENSE4040FSI for fast and easy integration.

Key features and Benefits

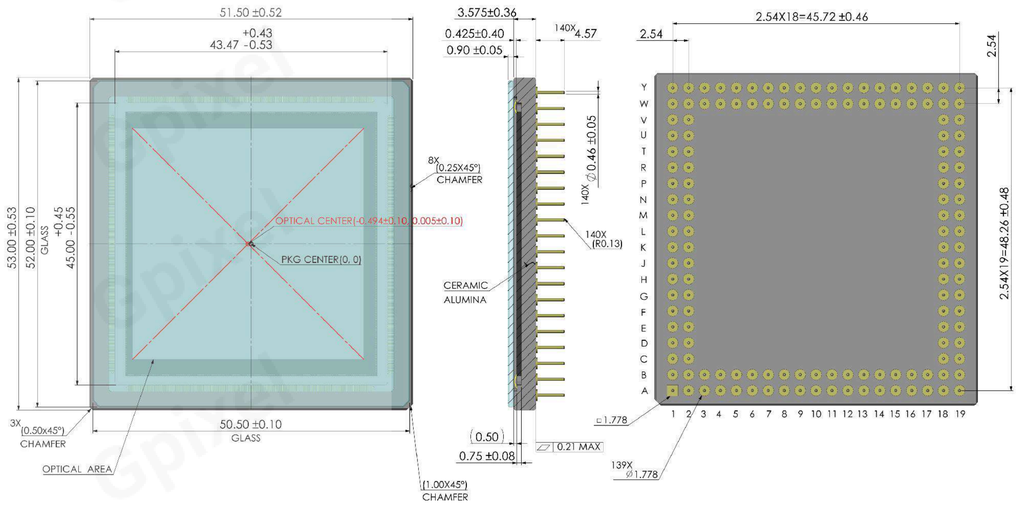
· Large format BSI scientific CMOS
· Low readout noise

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

Specifications			
Nr of Active Pixels	4096 (H) x 4096 (V)	**Pixel size**	9 μm x 9 μm
Optical format	3.3"	**Shutter type**	Rolling shutter
Photosensive area	36.864 mm x 36.864 mm	**Input clock rate**	50 MHz
Peak QE	90% @ 550 nm	**Full well capacity**	39 ke^-
Dark Current	0.04 e^-/pixel/s @ -40 °C	**Temporal noise**	2.3 e^-
Max Frame rate	24 fps	**Dynamic Range**	85 dB
Output format	18 ch LVDS	**Max. Data rate**	10.8 Gbps
Chroma	Mono	**Power consumption**	<1.4 W
Supply voltage	3.3 V(analog), 1.8 V(digital)	**Package**	140 pins PGA (51.5 mm x 53.0 mm)

Package Drawing



GSENSE6060

37MP SCIENTIFIC CMOS IMAGE SENSOR

GSENSE6060 and its pin-compatible back-thinned version GSENSE6060BSI, are designed with a large imaging area for demanding astronomical and scientific imaging applications. With its top and bottom readout chains consisting of 2×25 LVDS pairs running up to 630MHz, GSENSE6060's frame rate is up to 44 fps with 12bit ADC, allowing scientists to observe with the never-achieved temporal resolution of large format imagers. The two readout chains also provide the possibility for HDR combination up to 89 dB.The Aluminum Nitride package of GSENSE6060 provides 10x thermal conductivity than the traditional Alumina package, as well as excellent flatness both at the room temperature and deep-cooled temperatures.

Key features and Benefits

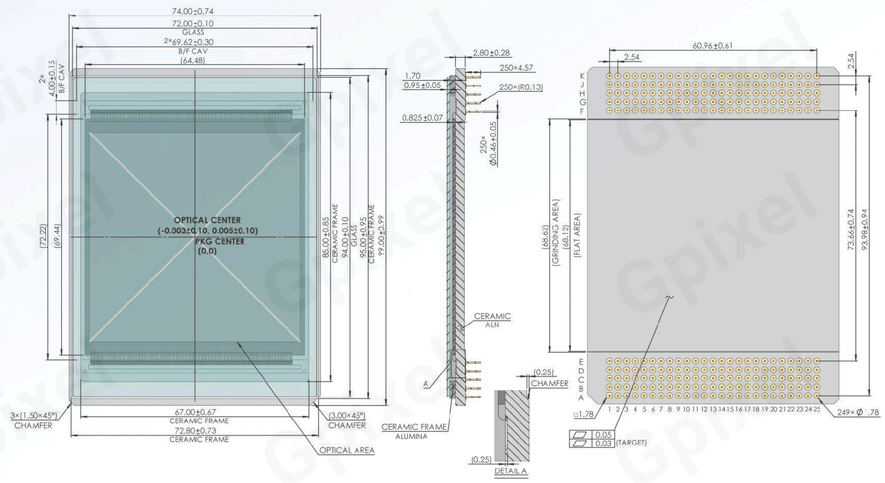
· Large format scientific CMOS
· Peak QE of 71.6%
· 14bit with CMS

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

Specifications			
Nr of Active Pixels	6144 (H) x 6144 (V)	**Pixel size**	10 µm x 10 µm
Optical format	5.4"	**Shutter type**	Rolling shutter
Photosensive area	61.44 mm x 61.44 mm	**Input clock rate**	52.5 MHz @ 12 bit, 45 MHz @ 14 bit
Peak QE	72% @ 550 nm	**Full well capacity**	133 ke⁻
Dark Current	0.01 e⁻/pixel/s @ -70°C	**Temporal noise**	4.6 e⁻
Max Frame rate	44 fps @ 12 bit STD	**Dynamic Range**	89 dB @12 bit HDR
Output format	52 ch LVDS	**Max. Data rate**	31.5 Gbps
Chroma	Mono	**Power consumption**	5.42 W
Supply voltage	6.5 V(analog),1.85 V(digital)	**Package**	250 pins PGA (74.0 mm x 99.0 mm)

Package Drawing



GSENSE6060BSI

37MP SCIENTIFIC BSI CMOS IMAGE SENSOR

GSENSE6060BSI is designed with a large imaging area for demanding astronomical and scientific imaging applications. With its top and bottom readout chains consisting of 2×25 LVDS pairs running up to 420 MHz, GSENSE6060BSI's frame rate is up to 26 fps with 12 bit ADC, allowing scientists to observe with the never-achieved temporal resolution of large format imagers. The Aluminum Nitride package of GSENSE6060BSI provides 10x thermal conductivity than the traditional Alumina package, as well as excellent flatness both at the room temperature and deep-cooled temperatures. GSENSE6060BSI is equipped with removable glass lids.

Key features and Benefits

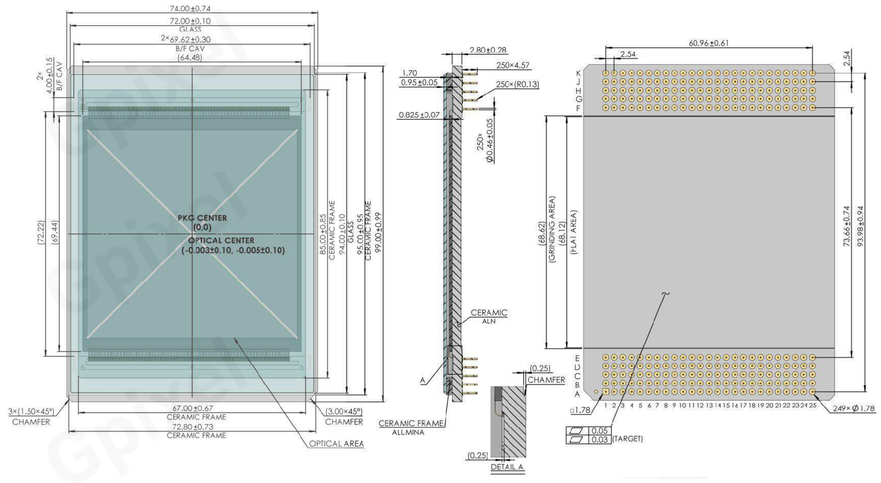
· Large format scientific CMOS
· Peak QE of 95%
· 14bit with CMS

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

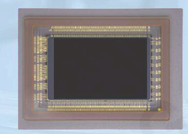
Specifications			
Nr of Active Pixels	6144 (H) x 6144 (V)	**Pixel size**	10 µm x 10 µm
Optical format	5.4"	**Shutter type**	Rolling shutter
Photosensive area	61.44 mm x 61.44 mm	**Input clock rate**	35 MHz @ 12 bit, 30 MHz @ 14 bit
Peak QE	95% @ 580 nm	**Full well capacity**	95 ke⁻
Dark Current	0.019 e⁻/pixel/s @ -53°C	**Temporal noise**	2.3 e⁻
Max Frame rate	26 fps @ 12 bit STD	**Dynamic Range**	90 dB @ 12 bit HDR mode, 73 dB @ 12 bit STD mode, 77 dB @ 14 bit STD mode
Output format	52 ch LVDS	**Max. Data rate**	31.5 Gbps
Chroma	Mono	**Power consumption**	4.6 W
Supply voltage	6.5 V(analog),1.85 V(digital)	**Package**	250 pins PGA (74.0 mm x 99.0 mm)

Package Drawing



GSENSE3243BSI

43MP SCIENTIFIC CMOS IMAGE SENSOR



GSENSE3243BSI is a 31 mm diagonal stacked BSI image sensor designed with 3.2 μm pixels. The full resolution of the sensor can be read out at a bit depth of 14 bits and a maximum frame rate of 100 fps using an on-chip high speed serial interface or at 50 fps over 32 sub LVDS channels operating at 1.05 Gbps/channel. The image sensor has a peak quantum efficiency over 80%, a wide angle response, read noise of 3.3 e^- at full speed, and a dark current less than 1 e^-/pixel/second at 0degree.The sensor achieves a dynamic range of 75 dB in dual gain mode and up to 104 dB using the more advanced HDR features.

Key features and Benefits

- Stacked BSI
- High sensitivity
- Low noise
- High dynamic range
- Multi-slope HDR
- Dual Gain HDR

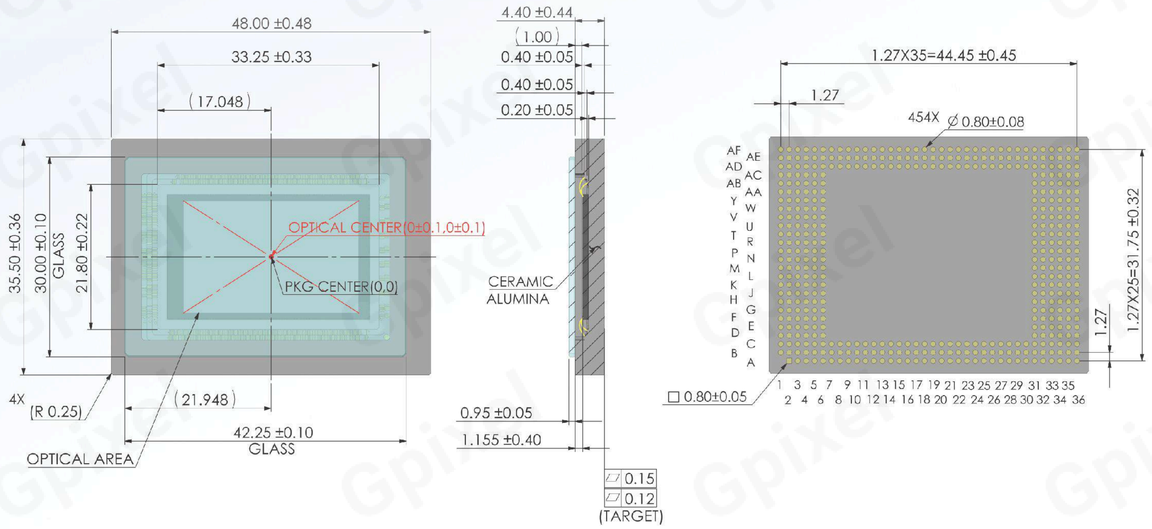
Application

- Spectroscopy
- Life Sciences
- Astronomy
- Microscopy

Specifications

Nr of Active Pixels	8192 (H) x 5232(V)	**Pixel size**	3.2 μm x 3.2 μm
Optical format	APS-C	**Shutter type**	Rolling shutter
Photosensive area	26.2 mm x 16.7 mm	**Max. SNR**	50 dB
Peak QE	80% @550nm (Mono)	**Full well capacity**	96 ke^- @ Multi-exposure Mode
Dark Current	1 e^-/pixel/s	**Temporal noise**	3.3 e^- (STD) / 4.4 e^- (HDR)
Max Frame rate	100 fps	**Dynamic Range**	74.7 dB / 80.8 dB (x4)
Output format	32 pairs sLVDS / 16 pairs GSI	**Max. Data rate**	84 Gbps
Chroma	Mono	**Power consumption**	4 W
Supply voltage	3.3V / 1.8V / 1.25V -2.2V / 4.5V	**Package**	455 pins LGA (48.0 mm x 35.5 mm)

Package Drawing



GSENSE6510BSI

10.2MP SCIENTIFIC CMOS IMAGE SENSOR

GSENSE6510BSI is a 3200 x 3200 (10.2 MP) resolution image sensor with industry-standard 6.5 μm x 6.5 μm pixel and large 29.4 mm diagonal for increased throughput in microscopy applications compared to 19 mm sCMOS devices. With a peak QE of 95% and read noise of 0.7 e^- median, the sensor achieves exceptional signal-to-noise in extreme low light applications. The sensor offers five imaging modes. In 12-bit mode, the sensor delivers 62.3 dB of dynamic range with a read noise floor or 1.3 e^- at 88 fps. In 11-bit HDR mode, the sensor uses dual-gain readout to achieve 78.8 dB of dynamic range with a read noise of 1.8 e^- at the same 83 fps. Additionally, the sensor offers two high-speedmodes, an 8-bit mode reaching 500 fps and an 11-bit mode reaching 166fps.

Key features and Benefits

- Low noise
- Dual Gain HDR
- High sensitivity
- High frame rate

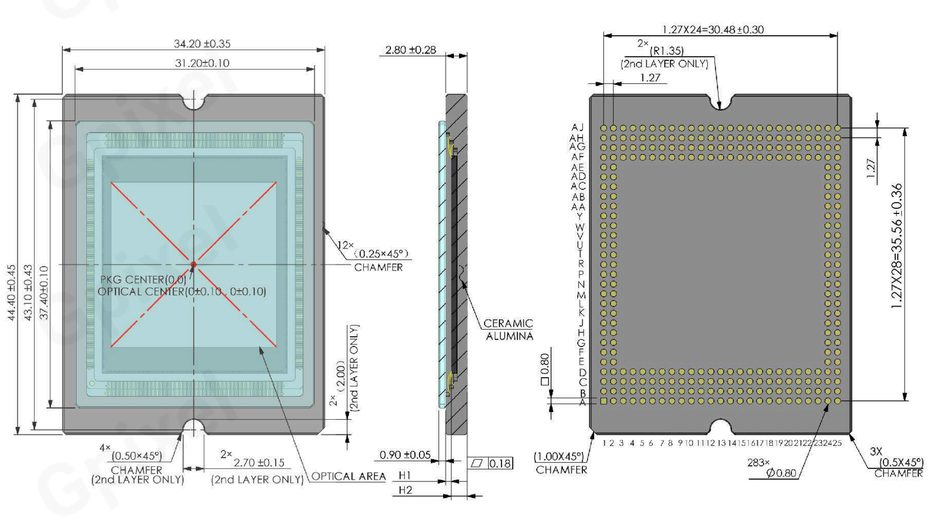
Application

- Life Sciences
- Microscopy

Specifications

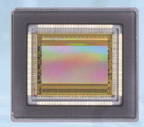
Nr of Active Pixels	3200 (H) x 3200(V)	**Pixel size**	6.5 μm x 6.5 μm
Optical format	1.83"	**Shutter type**	Rolling shutter
Photosensive area	20.8 mm x 20.8 mm	**Input clock rate**	960 MHz
Peak QE	95% Peak QE @ 610 nm	**Full well capacity**	21 ke^-
Dark Current	0.2 e^-/pixel/s @ -10°C	**Temporal noise**	0.7 e^-
Max Frame rate	500 fps @ 8bit	**Dynamic Range**	78.8 dB
Output format	72 pairs LVDS	**Max. Data rate**	69.12 Gbps @ 8 bit
Chroma	Mono	**Power consumption**	<5 w @ 8 bit,<2.7 w @ 12 bit
Supply voltage	3.6V (analog),2V (digital)	**Package**	284 pins LGA (44.4 mm x 34.2 mm)

Package Drawing



GSENSE2011

2MP SCIENTIFIC CMOS IMAGE SENSOR



GSENSE2011 is a 2Mega pixel resolution scientific CMOS image sensor, capable of operating with either global or rolling shutter. Featured with six transistor (6T) pixel design on a 6.5 μm pitch, the sensor has a very low readout noise of 2.1 e^- in rolling shutter HDR mod with max. frame rate is 83 fps in 12 bit rolling HDR mode. Sensor's HDR mode is based on dual gain HDR, meaning sensor outputs two images with Low gain setting and High gain setting after each exposure, combining the two images off-chip with HDR construction algorithm allow up to 87 dB dynamic range. The sensor also supports 653 fps Global DDS mode with trade-off on readout noise. These features make GSENSE2011 an ideal sensor for various applications.

Key features and Benefits

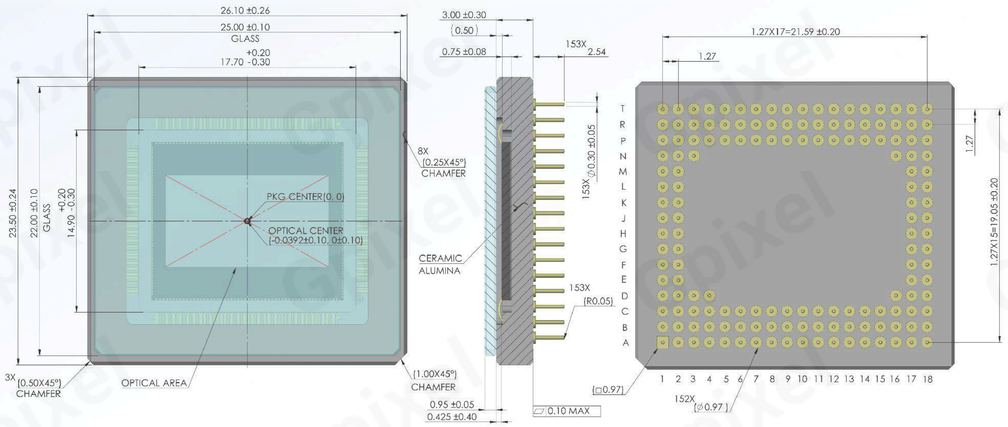
· Scientific CMOS
· Peak QE of 72%
· Low noise, low power for long exposure modes

Application

· Spectroscopy · Life Sciences · Astronomy · Microscopy · X-Ray

Specifications			
Nr of Active Pixels	2048 (H) x 1152 (V)	**Pixel size**	6.5 μm x 6.5 μm
Optical format	1"	**Shutter type**	Global & Rolling shutter
Photosensive area	13.3 mm x 7.5 mm	**Input clock rate**	50 MHz
Peak QE	72% @ 595 nm	**Full well capacity**	45 ke^-
Dark Current	13 e^-/pixel/s @ 30°C	**Temporal noise**	2.1 e^-
Max Frame rate	653 fps @ GS DDS,83 fps @ RS HDR	**Dynamic Range**	87 dB
Output format	8 ch LVDS @ RS HDR,32 ch LVDS @ GS DDS	**Max. Data rate**	4.8 Gbps
Chroma	Mono, RGB Color	**Power consumption**	<811 mW
Supply voltage	3.3 V(analog),2.0 V(digital)	**Package**	153 pins μPGA (6.1 mm x 29.5 mm)

Package Drawing



GSENSE1081BSI

81MP SCIENTIFIC BSI CMOS IMAGE SENSOR

GSENSE1081BSI is designed with large imaging area for demanding scientific imaging applications. Sensor provides active resolution of 8900(H) x 9120(V) with 10 μm x 10 μm pixel size. An inter-scene dynamic range is 84.5 dB combined from maximum full well capacity of 90 ke^- and readout noise of 5.35 e^-.Sensor supports on-chip 16 bit ADC, with LVDS channel running up to 250 MHz, providing frame rate up to 0.34 fps. GSENSE1081BSI is assembled in high-end SiC package with one flexi-cable, by this design, the dead space at 3x package sides is minimized and makes sensor well fit for applications require a mosaic sensor array. The thermal expansion of SiC is close to silicon die which is suitable for deep cooling applications.

Key features and Benefits

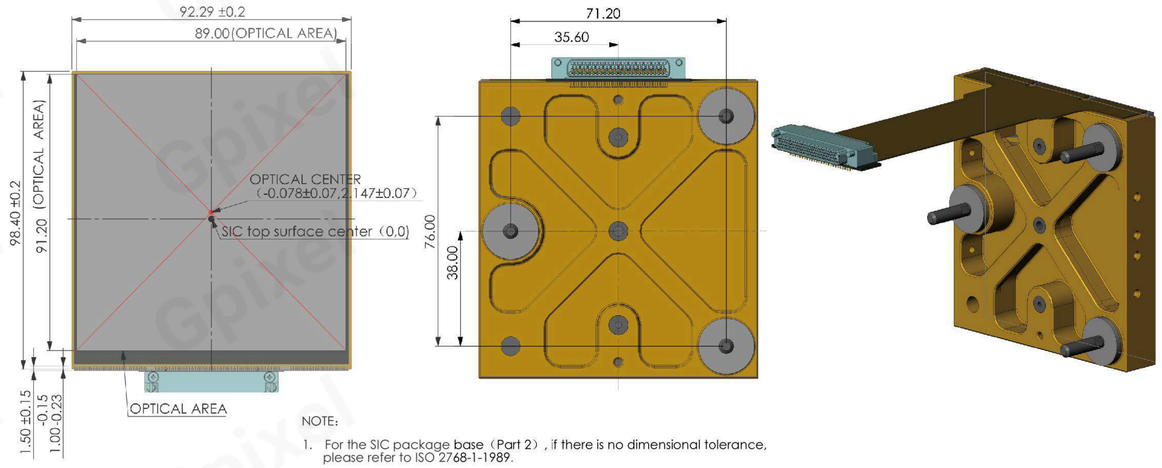
· 97% Peak QE @ 610 nm
· Anti-glowing
· On-chip 16-bit column-parallel ADC
· Silicon carbide with one flexi-cable

Application

· Astronomy

Specifications			
Nr of Active Pixels	8900 (H) x 9120 (V)	**Pixel size**	10 μm x 10 μm
Optical format	7.96"	**Shutter type**	Rolling shutter
Photosensive area	89.00 mm x 91.20 mm	**Input clock rate**	15.625 MHz
Peak QE	97.11% @ 610 nm	**Full well capacity**	90.68 ke^-
Dark Current	0.00373 e^-/pixel/s @ -70°C	**Temporal noise**	5.35 e^-
Max Frame rate	0.34 fps @ 16-bit ADC , 0.94 fps @ 15-bit ADC	**Dynamic Range**	84.5 dB
Output format	5 ch LVDS	**Max. Data rate**	Max.500Mbps @ 16-bit ADC, Max.1.6Gbps @ 15-bit ADC
Chroma	Mono	**Power consumption**	1.4 W
Supply voltage	5 V(analog),1.8 V(digital)	**Package**	100-pin SiC package (92.3 mm x 98.4 mm)

Package Drawing



NOTE:

1. For the SIC package base（Part 2）, if there is no dimensional tolerance, please refer to ISO 2768-1-1989.
2. For Part 1, the tolerance is 10% of the size.

GMAX | GSPRINT | GSENSE | **GLUX** | GTOF | GCINE | GL

Area Scan CMOS Image Sensor

The GLUX series is a backside illuminated, scientific grade CMOS image sensor product family combining sub-electron noise performance with high frame rates for ultra-low light imaging in scientific and surveillance applications. This series of products combines sub-electronic readout noise and high frame rate characteristics and can be widely used in scientific imaging and low-light applications. monitor the field.

GLUX9701BSI GLUX1605BSI

Product Family Features

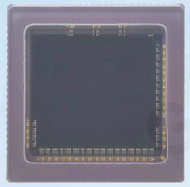
- Large pixel size
- Sub-electronic noise
- Low power consumption
- Back illuminated
- High sensitivity

Applications

- Scientific imaging
- Low-light Monitoring
- Ultraviolet industrial inspection

GLUX9701BSI

1.3MP BSI CMOS IMAGE SENSOR



GLUX9701BSI a 1" sized, high sensitivity BSI sCMOS image sensor with a resolution of 1.3MP (1280 x 1024) and large 9.76 µm x 9.76 µm pixels. Sensor supports a dual-gain HDR mode, achieving dynamic range of 89.5 dB by combining 1.6 e^- readout noise. A dedicated low noise mode further optimizes imaging performance with read noise of 0.85 e^- and power consumption of only 122 mW.

Key features and Benefits

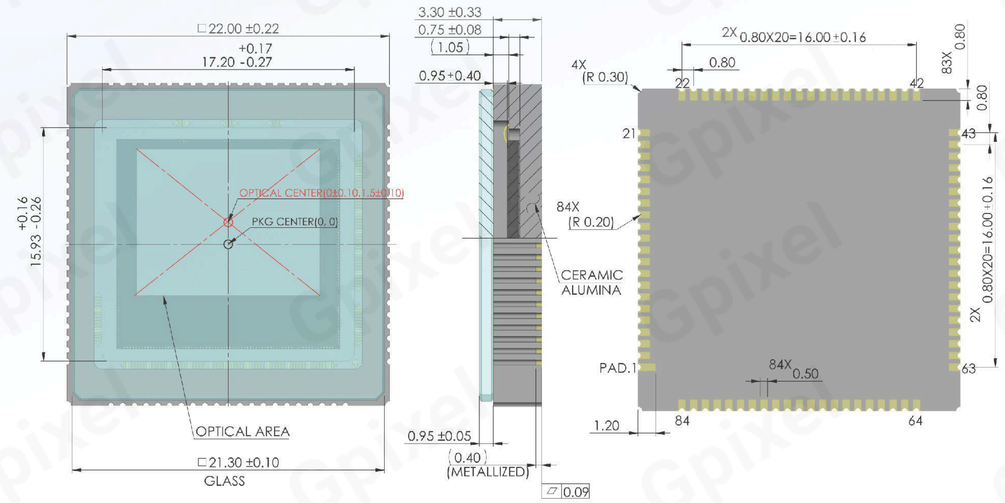
- High sensitivity
- <1 e^- readout noise
- High dynamic range

Application

Microluminescence Imaging

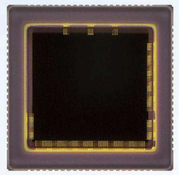
Specifications			
Nr of Active Pixels	1280 (H) x 1024 (V)	**Pixel size**	9.76 µm x 9.76 µm
Optical format	1"	**Shutter type**	Global shutter
Photosensive area	12.493 mm x 9.994 mm	**Full well capacity**	48 ke^-
Peak QE	89% @ 610 nm	**Temporal noise**	0.85 e^-
Max. SNR	46.8 dB	**Dark Current**	0.08 e^-/pixel/s @ -28°C
Max Frame rate	30 fps	**Dynamic Range**	89.5 dB @ HDR
Output format	4 ch sub-LVDS,4 ch MIPI	**Chroma**	Mono
Max. Data rate	1.782 Gbps	**Supply voltage**	3.3 V(analog),1.8 V(digital)
Power consumption	200 mW @ HDR,122 mW @ low noise	**Package**	84 pins CLCC (22.0 mm x 22.0 mm)

Package Drawing



GLUX1605BSI

0.5MP BSI CMOS IMAGE SENSOR



GLUX1605BSI is a 0.5 Megapixel resolution BSI CMOS image sensor with 16 µm x 16 µm pixel size.The sensor operates in electronic rolling shutter in two operation modes: low noise mode, and HDR mode. User can choose which to operate in camera based on practical application's requirement on full well capacity, noise, dynamic range, etc. It integrates two types of output channels(sub-LVDS and MIPI) and on-chip sequencer, which enables the sensor development less effort and hardware resource. GLUX1605BSI is pin compatible with GLUX9701BSI (1inch SXGA of GLUX image sensor family), users can operate both sensors with one set of PCB design.

Key features and Benefits

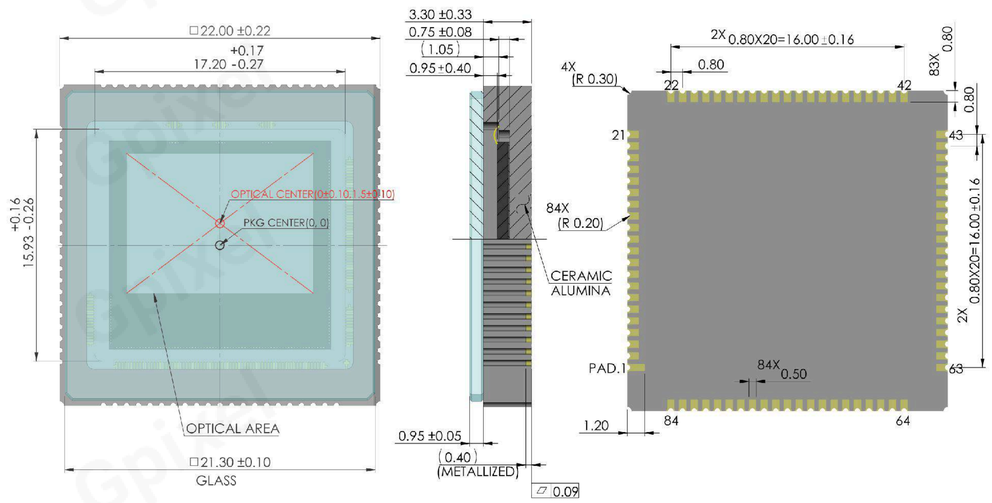
- Operation mode – HDR mode & Low noise mode
- Optical Format: 1 inch
- On–chip PLL
- On–chip 12–bit column–parallel ADC
- On–chip sequencer

Application

Microluminescence Imaging

Specifications			
Nr of Active Pixels	800 (H) x 600 (V)	**Pixel size**	16 µm x 16 µm
Optical format	1"	**Shutter type**	Rolling Shutter
Photosensive area	12.8 mm x 9.6 mm	**Full well capacity**	73 ke^-
Peak QE	90.7% @ 550 nm	**Temporal noise**	0.9 e^- @ low noise mode
Max. SNR	48.7 dB	**Dark Current**	39 e^-/pixel/s @ 20°C
Max Frame rate	60 fps	**Dynamic Range**	93 dB @ HDR
Output format	4 ch sub-LVDS,4 ch MIPI	**Chroma**	Mono
Max. Data rate	1.782 Gbps	**Supply voltage**	3.3 V(analog),1.75 V(digital)
Power consumption	201 mW @ HDR , 83 mW @ Low noise	**Package**	84 pins CLCC (22.0 mm x 22.0 mm)

Package Drawing



Gpixel

GMAX | GSPRINT | GSENSE | GLUX | GTOF | GCINE | GL

Area Scan CMOS Image Sensor

The GTOF series of products is the iToF image sensor series launched by Gpixel, which adopts advanced stack and back-illuminated technology, and is oriented to high-precision depth measurement and ranging applications.

GTOF0503

Product Family Features

- Stack back illuminated
- High measurement accuracy
- High sensitivity
- Dual frequency mode

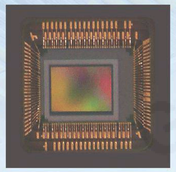
Applications

- Vision-guided Robots
- Industrial Automation
- Security monitoring
- Disorderly Grasping
- Logistics
- 3D measurement

Gpixel

GTOF0503

VGA ITOF CMOS IMAGE SENSOR



GTOF0503 is a VGA sensor featuring a 5 μm 3-tap state-of-the-art iTof pixel incorporating a pixel array with a resolution of 640 x 480 pixels. The BSI technology provides excellent sensitivity at NIR wavelengths. In addition, the wafer stacking enables very high modulation frequencies of up to up to 3ns pulse width and 30 depth frames per second which results in industry-leading depth accuracy at short, mid and long-range distances even in challenging ambient light conditions by using pulse modulation iToF technique. Advanced features such as multiple acquisition modes, depth with single and dual-frequency, low-power standby modes and an industry standard MIPI CSI-2 interface, allow very versatile and flexible operation.

Key features and Benefits

- Machine Vision
- Automated Guided Vehicle
- Industrial Automation
- Bin Picking
- Logistics
- Smart Factory

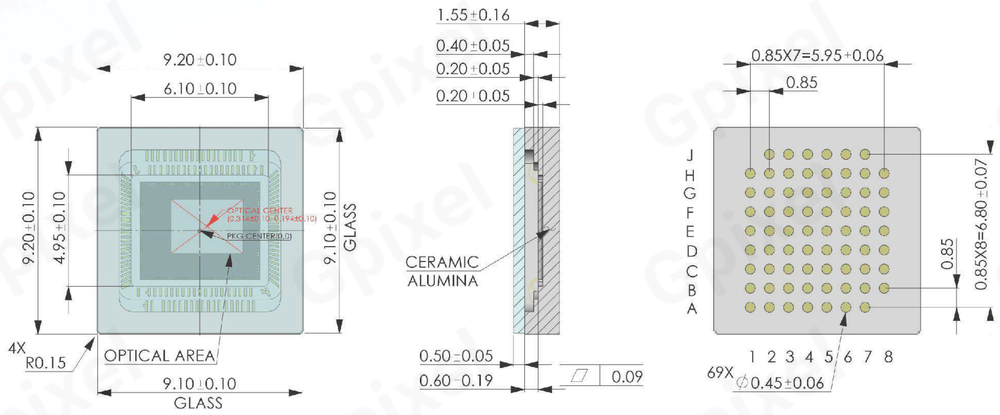
Application

- Automation & Inspection
- Logistics
- ADAS & Intelligent Driving
- Robotics
- Consumer Electronics

Specifications

Nr of Active Pixels	640 (H) x 480 (V)	**Pixel size**	5 μm x 5 μm
Optical format	1/4"	**Shutter type**	Global Shutter
Photosensive area	3.2 mm x 2.4 mm	**Full well capacity**	10 ke^-
Peak QE	>20% @ 940 nm	**Temporal noise**	<7e^-
Max. SNR	40 dB	**ADC**	11 bit
Max Frame rate	60 fps	**Dynamic Range**	60 dB
Output format	4 ch CSI-2 MIPI	**Chroma**	Mono
Binning	2x2 and 4x4	**Supply voltage**	2.8 V/1.8 V/1.2 V/1.3 V
Power consumption	330 mW	**Package**	139 pads(Die),69 pins LGA (9.2 mm x 9.2 mm)

Package drawing



GMAX | GSPRINT | GSENSE | GLUX | GTOF | GCINE | GL

Area Scan CMOS Image Sensor

The GCINE series is a series of image sensors launched by Gpixel for the professional imaging and broadcasting fields. The products utilizing stacked back-illuminated technology and have excellent features such as high resolution, high frame rate, high sensitivity, and high dynamic range. The products can meet the needs of many industries such as 8K broadcast TV, professional photography, drones, and high-end 8K video imaging.

GCINE3243 GCINE4349

Product Family Features

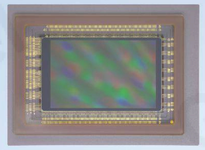
- Stack back illuminated
- High frame rate
- High dynamic range
- Low noise

Applications

- Professional imaging

GCINE3243

8K APS-sized CMOS Image Sensor



GCINE3243 is a 43MP 26.2 x 16.7 mm² sized APS-style image sensor with a 3.2 µm² BSI pixel size designed specifically for the demands of high-end video imaging. With a resolution of 8192 x 5232 pixels and highly configurable read out, 8K video at 60 fps or binned 4K video at 120 fps is supported, all at an impressive bit depth of up to 14 bits per pixel. Read out of the image data occurs over 32 sub LVDS channels @ 1.05 Gbps/channel.A dedicated Digital Still Camera (DSC) mode is supported, improving the read-out noise and offering global reset shutter control. Additional HDR features, like dual gain read-out, on-chip digital compression and multi-slope pixel response are all available.

Key features and Benefits

- Stacked BSI architecture
- High Full Well Charge
- High Dynamic Range
- Low noise
- Multi-slope HDR
- Dual Gain HDR

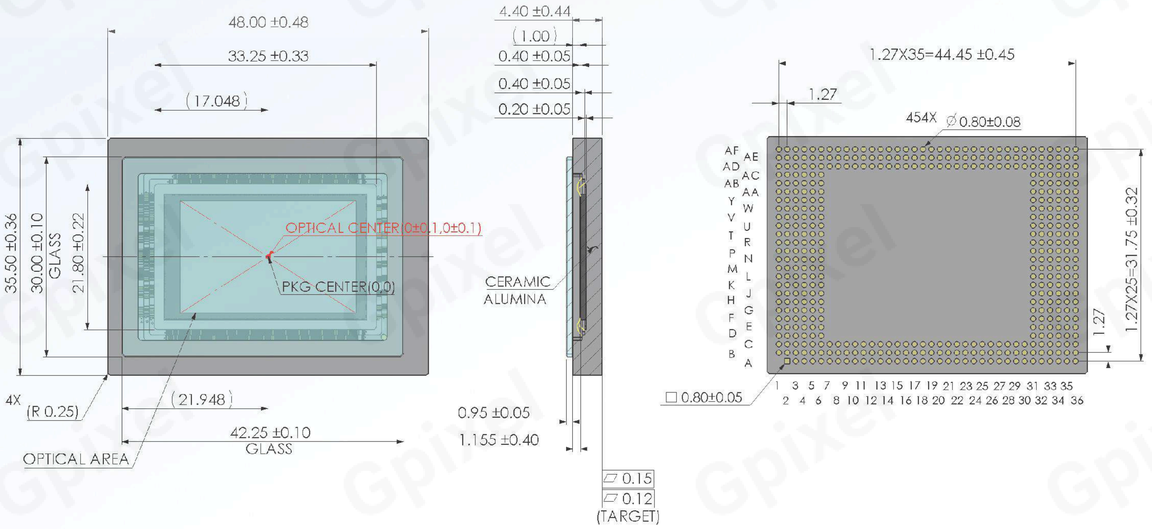
Application

- Cinematography
- Unmanned Aerial Vehicles (UAV)

Specifications

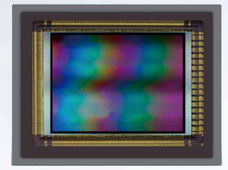
Nr of Active Pixels	8192 (H) x 5232(V)	**Pixel size**	3.2 µm x 3.2 µm
Optical format	APS-C	**Shutter type**	Rolling Shutter & DSC
Photosensive area	26.2 mm x 16.7 mm	**Full well capacity**	96 ke⁻ @ Multi-exposure Mode
Peak QE	80% @ 550 nm (Mono)	**Temporal noise**	2.5 e⁻ @ DSC High Gain Mode
Max. SNR	50 dB	**ADC**	14 bit
Max Frame rate	60 fps @ 8K, 120 fps @ 4K	**Dynamic Range**	81dB @ 8K HDR mode
Output format	32 ch sub-LVDS	**Chroma**	Mono, RGB Color
Max. Data rate	33.6 Gbps	**Supply voltage**	3.3 V/1.8 V/1.25 V -2.2 V/4 V
Power consumption	2 W – 4 W	**Package**	455 pins LGA (48.0 mm x 35.5 mm)

Package Drawing



GCINE4349

8K Full Frame-sized CMOS Image Sensor



GCINE4349 is a 49MP (35.2 x 25.8 mm) full frame image sensor with a 4.3 µm BSI pixels designed specifically for the demands and performance of high-end video imaging. With a maximum resolution of 8192 x 6000 pixels, several readout modes are supported to read out 8K or binned 4K video with maximum frame rates of up to 120 fps at 8K resolution and up to 240 fps at binned 4K resolutions, all with a pixel bit depth of up to 16 bit/pixel interfaced over 64 sub LVDS channels @ 1.2 Gbps/channel.Firstly, a proprietary Variable Slope High Dynamic Range method achieving an exceptionally high 110 dB of Dynamic Range. GCINE4349 is packaged in a 431-pin LGA ceramic package and comes with a double side AR coated glass lid.

Key features and Benefits

- Stacked BSI
- High sensitivity
- High Dynamic Range
- Low noise
- Multi-slope HDR

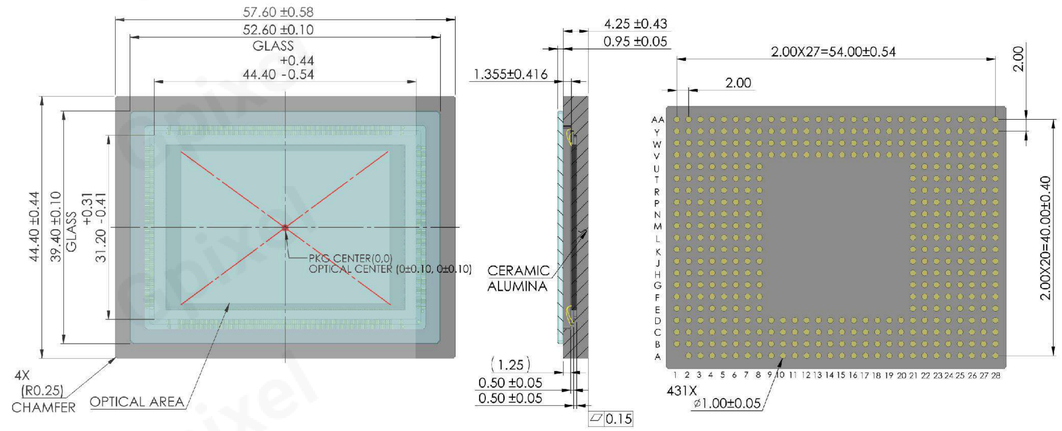
Application

- Cinematography
- Unmanned Aerial Vehicles (UAV)

Specifications

Nr of Active Pixels	8192 (H) x 6000 (V)	**Pixel size**	4.3 µm x 4.3 µm
Optical format	2.2" (Full Frame)	**Shutter type**	Rolling Shutter & DSC
Photosensive area	35.2 mm x 25.8 mm	**Full well capacity**	144 ke⁻
Peak QE	75%	**Temporal noise**	2 e⁻
Max. SNR	52 dB	**ADC**	16 bit
Max Frame rate	120 fps @ 8K,240fps @ 4K	**Dynamic Range**	87 dB (up to 110 dB)
Output format	64 ch Sub-LVDS	**Chroma**	Mono, RGB Color
Max. Data rate	76.8 Gbps	**Supply voltage**	3.3 V/ 1.8 V/1.25 V/ -2.2V
Power consumption	3.3 W-8.1 W	**Package**	431 pins LGA (57.6 mm x 44.4 mm)

Package Drawing



GMAX | GSPRINT | GSENSE | GLUX | GTOF | GCINE | GL

Line Scan CMOS Image Sensor

The GL sensor family from Gpixel comprises a wide range of horizontal resolutions, ranging from 2k to 16k, with line rates of up to 200 kHz. These sensors feature pixel sizes of 3.5 μm, 5 μm, 7 μm, and 14 μm, providing a comprehensive selection to suit diverse line scan applications.

GL1402
GL3504
GL0402
GL0816
GLT5009BSI
GL7008
GL3516

Product Family Features

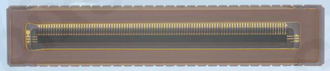
- Global shutter
- High line frequency
- TDI
- Multispectral

Applications

- Lithium Battery Detection
- Screen Detection
- Printing Detection
- Automatic Sorting
- Track Detection
- Semiconductor Testing
- PCB Testing

GL1402

2K LINE SCAN CMOS IMAGE SENSOR



GL1402 is available in color and mono variants. GL1402 color features red, green, and blue rows with 14 μm gaps between each row to minimize color crosstalk. Read out speed is 27 kHz. GL1402 mono features a three row monochrome option with a read out speed of 27 kHz, or a one row monochrome option with a readout speed of 81 kHz.GL1402 power consumption is less than 420 mW at maximum read out speed. The sensor is assembled into a 54 pin CLCC package with outer dimensions 38 x 7.4 mm.

Key features and Benefits

· Cost Efficient
· Low Power Consumption
· High Frame Rate
· High Dynamic Range

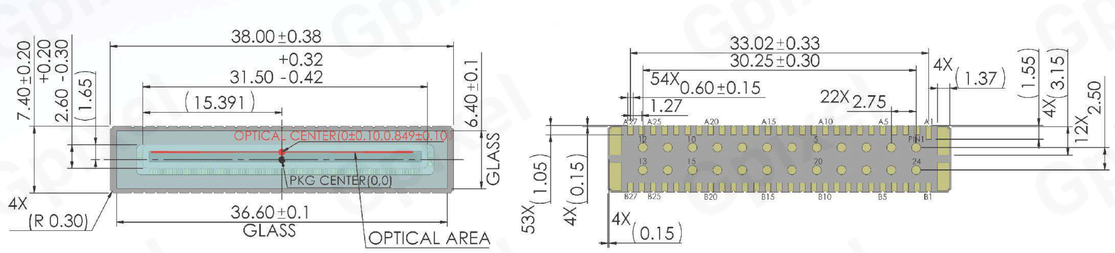
Application

· Automation & Inspection
· Tomography (OCT)

Specifications

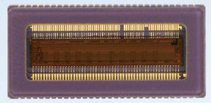
Nr of Active Pixels	2048 (H) x 1 (V), 2048 (H) x 3 (V)	**Pixel size**	14 μm x 14 μm
Optical format	28.896 mm	**Shutter type**	Global shutter
Full well capacity	28.7 ke⁻	**Photosensive area**	28.896 mm
Peak QE	69.3% @ 560nm	**Temporal noise**	9.1 e⁻
Max. SNR	44.5 dB	**Dark Current**	702.7 e⁻/pixel/s @ 30°C
Max Line rate	81 kHz @ single line	**Dynamic Range**	69.9 dB
Output format	4 ch Sub-LVDS	**Chroma**	Mono, RGB color
Channel multiplexing	4/2/1	**ADC**	12 bit
Max. Data rate	2.08 Gbps	**Supply voltage**	3.6 V (analog),1.8 V-3.3 V (IO),1.5 V (digital)
Power consumption	<0.42 W	**Package**	54-pins CLCC (38.0 mm x 7.4 mm)

Package Drawing



GL3504

2K/4K LINE SCAN CMOS IMAGE SENSOR



GL3504 is a line scan image sensor suitable for small format camera integration with C mount lens, the sensor contains two lines with 3.5 μm pixel and four lines with 7 μm pixel. GL3504 could run up to 172 kHz with 7 μm pixel line and 84 kHz with 3.5 μm pixel line at 12 bit output with single line read out.GL3504 is assembled with a compact 58-pin CLCC package for fast heat dissipation and high robustness. Both mono and color variances are offered. For color variance, 7 μm lines are with RGB true color coating and 3.5 μm lines are with Bayer pattern.

Key features and Benefits

· High Speed
· Low Consumption
· High Dynamic Range

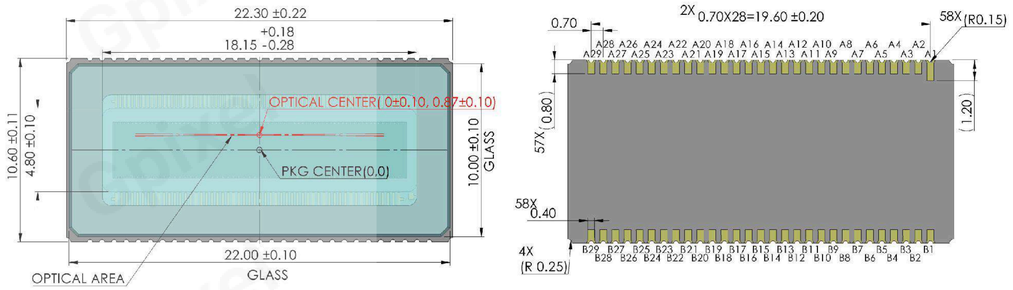
Application

· Automation & Inspection

Specifications

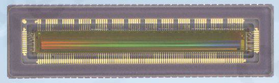
Nr of Active Pixels	4096 (H) x 2 (V) @ 3.5 μm / 2048 (H) x 4 (V) @ 7 μm	**Pixel size**	3.5 μm x 3.5 μm / 7 μm x 7 μm
Optical format	14.336 mm	**Shutter type**	Global shutter
Full well capacity	9.3 ke⁻	**Photosensive area**	14.336 mm
Peak QE	7 μm: 71.9% @ 570 nm,3.5 μm: 62.0% @ 620 nm	**Temporal noise**	12 bit: 4.9 e⁻,8 bit: 21.2 e⁻
Max. SNR	39.7 dB	**Dark Current**	2.1 ke⁻/pixel/s @ 63°C
Max Line rate	172.7 kHz @ 7μm @ 12 bit @ single line	**Dynamic Range**	65.8 dB @ 3.5 μm @ 12 bit
Output format	6 ch Sub-LVDS	**Chroma**	Mono, RGB color
Channel multiplexing	6/3/2/1	**ADC**	8/12 bit
Max. Data rate	5.472 Gbps	**Supply voltage**	3.3 V(analog),2.5 V-3.3 V(IO),2.1 V(digital)
Power consumption	<1.0 W	**Package**	CLCC 58 pins (22.3 mm x 10.6 mm)

Package Drawing



GL0402

4K LINE SCAN CMOS IMAGE SENSOR



GL0402 is a 4096 x 2 resolution, 7 μm square pixel, global shutter linear image sensor that supports maximum 200 kHz line rate in single line mode and 100 kHz line rate in dual line mode. GL0402 offers low read noise of less than 5.2 e^- and 10 ke^- FWC, leads to 65.6 dB intra-scene dynamic range. GL0402 uses external clock and all required timing are generated by on chip sequencer, reducing the amount of external component needed; output channel multiplexing function enables flexibility on FPGA choice, suitable for cost-effective camera solution for demanding on line inspection applications. GL0402 is assembled with compact 76 pins CLCC package for fast heat dissipation and high robustness.

Key features and Benefits

· High Speed
· Low Noise
· High Dynamic Range

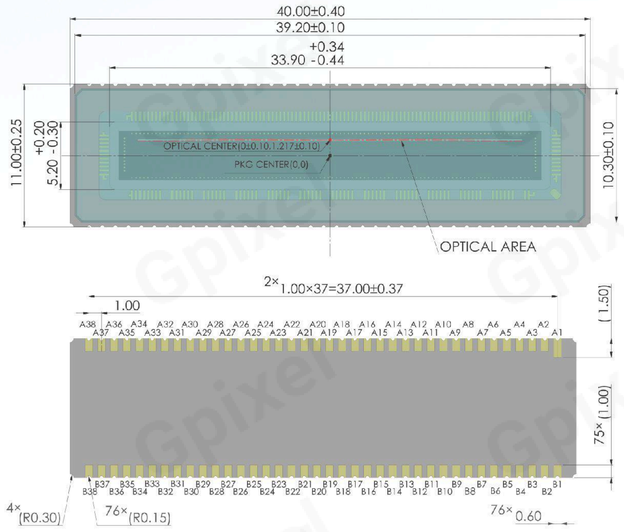
Application

· Automation & Inspection

Specifications

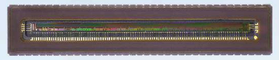
Nr of Active Pixels	4096 (H) x 2 (V)	**Pixel size**	7 μm x 7 μm
Optical format	28.67 mm	**Shutter type**	Global shutter
Full well capacity	25 ke^- @ low gain,10 ke^- @ high gain	**Photosensive area**	28.67 mm
Peak QE	75.57% @ 570 nm	**Temporal noise**	5.2 e^-
Max. SNR	43.9 dB	**Dark Current**	10 ke^-/pixel/s @ 70°C
Max Line rate	200 kHz @ single line,100 kHz @ dual line	**Dynamic Range**	65.6 dB @ high gain
Output format	12 ch Sub-LVDS	**Chroma**	Mono, RGB color
Channel multiplexing	12/6	**ADC**	12 bit
Max. Data rate	10.944 Gbps	**Supply voltage**	3.3 V(analog), 2 V(digital), 1.8 V-3.3 V(IO)
Power consumption	<2.25 W	**Package**	CLCC 76 pins (40.0 mm x 11.0 mm)

Package Drawing



GL7004

4K LINE SCAN CMOS IMAGE SENSOR



GL7004 is a 4096 (H) x 2/4 (V) resolution global shutter linear array CMOS image sensor, featuring 7 μm high-sensitivity pixels. Offered in two basic flavors: a multi color 4 row R+G+B+Mono and 2 row mono variants, the sensor allows each row to have a unique exposure time, with line rates up to 250 kHz in single line mode and 76.9 kHz in quad line mode. The sensor's high line rate is a perfect fit for high-throughput various industrial inspection applications including sorting various inspection applications like solar panel, printing and railway monitoring at a cost-effective price offering.The GL7004 is available in a compact LCC ceramic package, requiring only 3 external power supplies and consuming only 1.05W,making it easier for customers to design and integrate their systems.

Key features and Benefits

· Individual exposure control for each color line
· External Trigger
· High Frame Rate
· Low Power Consumption
· Cost Efficient

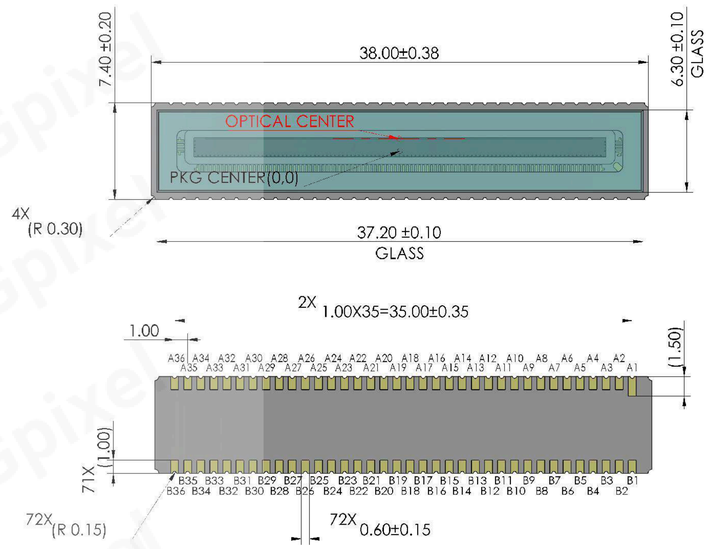
Application

· Automation & Inspection
· Logistic & Positioning

Specifications

Nr of Active Pixels	4096 (H) x 4 (V)	**Pixel size**	7 μm x 7 μm
Optical format	1.8"	**Shutter type**	Global shutter
Full well capacity	10.5 ke^-	**Photosensive area**	28.67 mm x 49 μm
Peak QE	76.8% @ 580 nm	**Temporal noise**	8.8 e^-
Max. SNR	40.2 dB	**Dark Current**	1.1 ke^-/s @ 44.7°C
Max Line rate	250 kHz @ single-line,76.9 kHz @ quad-line	**Dynamic Range**	61.5 dB
Output format	12 ch Sub-LVDS	**Chroma**	Mono, RGB color
Angular response	>20°(91% response)	**ADC**	10 bit
Max. Data rate	14.4 Gbps	**Supply voltage**	3.6 V(analog), 1.5 V(digital), 1.8 V-3.3 V(IO)
Power consumption	1.05 W	**Package**	72-pins CLCC (38.0 mm x 7.4 mm)

Package Drawing



GL0816

8322x16 LINE SCAN CMOS IMAGE SENSOR

GL0816 Designed for high speed industrial inspection, GL0816 is a line scan CMOS image sensor which consists of 16 lines of 8322 pixels with 5 µm pixel size and 5 µm inter-line space. It supports dual line, 4-line readout and max 8-line with 2-stage on-chip TDI. The maximum line rate of GL0816 is 200 kHz @ 11bit dual-line mode and 100 kHz @ 10bit 4-line mode. GL0816 is manufactured with Mono or RGBW 4-band CFA which is customized with extremely low color crosstalk to enable accurate image reproduction.

Key features and Benefits

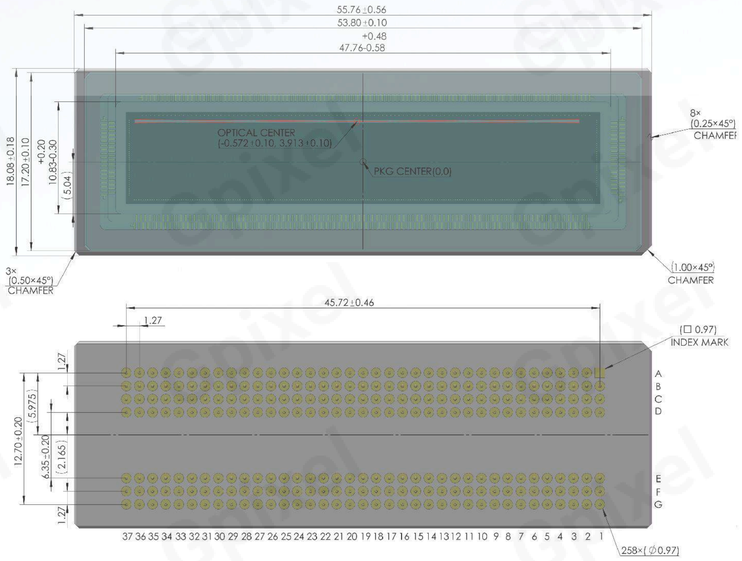
· High Speed
· High Resolution
· TDI

Application

· Automation & Inspection

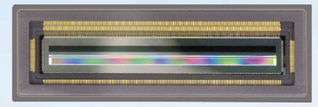
Specifications			
Nr of Active Pixels	8322 (H) x 16 (V)	**Pixel size**	5 µm x 5 µm
Optical format	41.61 mm	**Shutter type**	Global shutter
Full well capacity	17 ke⁻@ 11 bit, dual line; 15 ke⁻ @ 10 bit, quad line	**Photosensive area**	41.61 mm
Peak QE	>70% @ 600 nm	**Temporal noise**	13 e⁻ @ 11 bit, dual line; 17 e⁻ @ 10 bit quad line
Max. SNR	42 dB	**Dark Current**	6 ke⁻/pixel/s @ 76°C
Max Line rate	200 kHz @ 11 bit, dual line; 100 kHz @ 10 bit, quad line	**Dynamic Range**	62 dB @ 11 bit, dual line; 58.9 dB @ 10 bit, quad line
Output format	66 ch Sub-LVDS	**Chroma**	Mono, RGB color
Max. Data rate	800 Mbps	**Supply voltage**	3.3 V(analog), 2 V(digital/LVDS), 2.2 V(ADC)
Power consumption	<4 W	**Package**	258 Pins µPGA (55.8 mm x 18.1 mm)

Package Drawing



GLT5009BSI

9K BSI TDI CMOS IMAGE SENSOR



GLT5009BSI is a Backside illuminated (BSI), Time delay integration (TDI), charge domain CMOS image sensor with 5 µm pixels and 9k resolutions. The sensor has two photosensitive bands, 256 stages and 32 stages respectively, enabling a high dynamic range (HDR) imaging mode.The sensor integrates several features to ease camera integration including an internal sequencer, channel multiplexing, and selectable 2 scan directions. GLT5009BSI is assembled in a 269-pin µPGA package for reliability and good heat dissipation.

Key features and Benefits

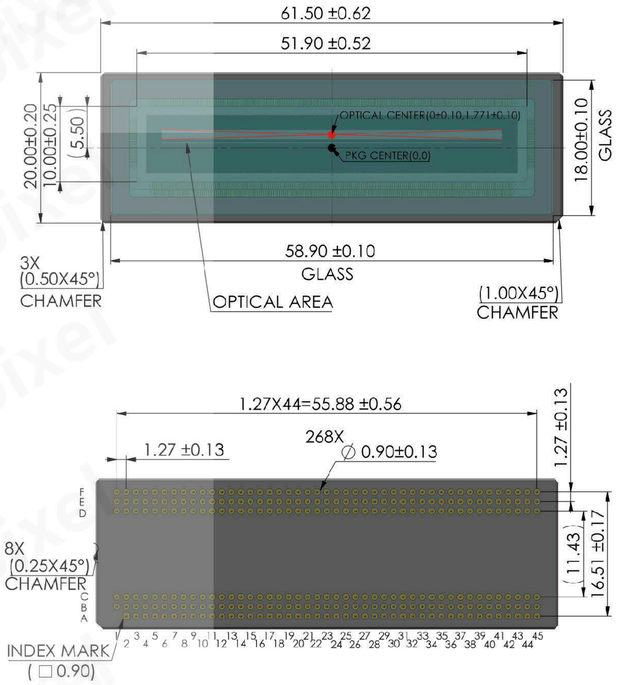
· True charge domain Time Delay Integration
· Back Side Illuminated (BSI) pixels
· High Sensitivity
· High Speed: up to 608 kHz
· HDR read out

Application

· Automation & Inspection

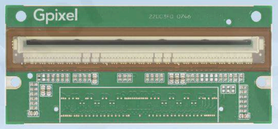
Specifications			
Nr of Active Pixels	9072 (H) x (256 + 32) (V)	**Pixel size**	5 µm x 5 µm
Optical format	45.36 mm	**Shutter type**	Global shutter
Full well capacity	16.3 ke⁻ @ 10 bit,19.2 ke⁻ @ 12 bit	**Photosensive area**	P1: 45.36 mm × 1.28 mm, P2: 45.36 mm × 0.16 mm
Peak QE	82.40% @ 550 nm	**Temporal noise**	10.6 e⁻ @ 10 bit ,7.0 e⁻ @ 12 bit
Max. SNR	42 dB	**Dark Current**	4 ke⁻/pixel/s @ 30°C
Max Line rate	608 kHz @ 10 bit,300 kHz @ 12 bit	**Dynamic Range**	63.7 dB @ 10 bit,68.7 dB @ 12 bit
Output format	84 ch Sub-LVDS	**Chroma**	Mono
Max. Data rate	74.304 Gbps	**Supply voltage**	5 V(analog),1.8 V(ADC),1.8 V(digital)
Power consumption	<5.8 W	**Package**	µPGA 269 pins (61.5 mm x 20.0 mm)

Package Drawing



GL7008

8K LINE SCAN CMOS IMAGE SENSOR



GL7008 is a global shutter line scan image sensor with 7 μm square pixel and 8192 horizontal pixels resolutions. The sensor's 12-bit ADC transmits data over 25 pairs of Sub-LVDS at line rate up to 200 kHz. GL7008 is offered in both color and monochrome versions. The monochrome sensor supports single and dual line modes with optimal sensitivity. At full speed, the power consumption of GL7008 is around 4.4 W. The sensor adopts a COB package with WCu heat sink for optimal heat dissipation during high-speed scanning.

Key features and Benefits

· Individual exposure control for each color line
· External Trigger
· Channel Multiplexing
· On Chip PLL
· On Chip Sequencer

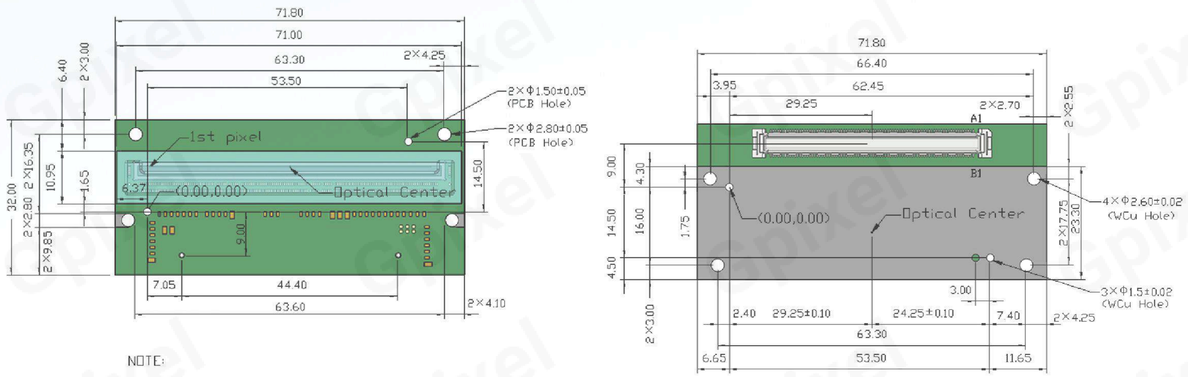
Application

· Automation & Inspection
· Logistic & Positioning

Specifications

Nr of Active Pixels	8192 (H) x 4 (V)	**Pixel size**	7 μm x 7 μm
Optical format	57.344 mm	**Shutter type**	Global shutter
Full well capacity	10 ke⁻	**Photosensive area**	57.344 mm
Peak QE	73.2% @ 530 nm	**Temporal noise**	6.8 e⁻
Max. SNR	40 dB	**Dark Current**	0.4 ke⁻/pixel/s @ 44°C
Max Line rate	200 kHz @ single line, 100 kHz @ dual line	**Dynamic Range**	63.3 dB
Output format	25 ch sub-LVDS	**Chroma**	Mono, RGB color
Channel multiplexing	25/13/7/4	**ADC**	12 bit
Max. Data rate	24 Gbps	**Supply voltage**	3.3 V(analog), 1.8 V(digital), 1.8 V-3.3 V(IO)
Power consumption	4.4 W	**Package**	168 Pins COB (71.8 mm x 32.0 mm)

Package Drawing

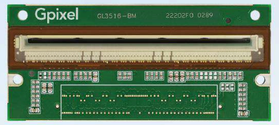


NOTE:

1. GL7008 COLOR 4 lines, Optical Center1(29.25±0.10,9.333±0
   GL7008 MONO 2 lines, Optical Center2(29.25±0.10,9.305±0.1
2. All tolerances +/-0.1mm unless otherwise noticed

GL3516

16K LINE SCAN CMOS IMAGE SENSOR



GL3516 is a 16384 x 2 resolution, 3.5 μm square pixel, line scan CMOS image sensor that supports maximum 120 kHz line rate in single line mode and 60 kHz line rate in dual line mode. GL3516 is pin and footprint compatible with Gpixel's existing GL7008 8K line scan sensor its features makes is an ideal solution for industrial inspection applications benefitting from high-speed scanning and 16K resolution, including high end inspection production inspections for lithium battery testing, flat panel displays, PCBs, labels, and railway inspection.GL3516 is offered in both color and monochrome versions. The monochrome sensor support single and dual line modes. The color sensor support dual line mode.GL3516 is assembled in a COB package with WCu heat sink for optimal heat dissipation and with connector for easy integration.

Key features and Benefits

· High Speed
· High Resolution
· Low Power Consumption
· Easy Integration

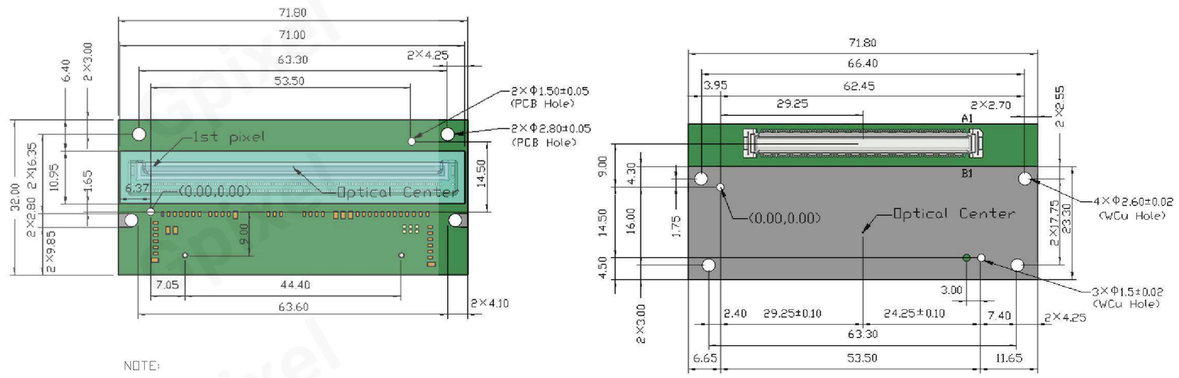
Application

· Automation & Inspection

Specifications

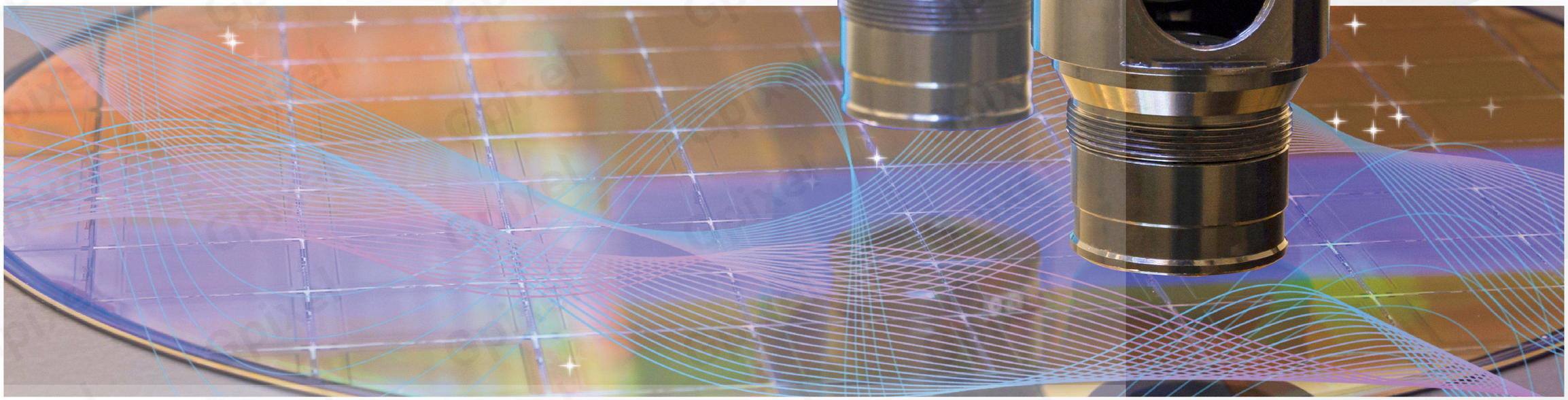
Nr of Active Pixels	16384 (H) x 2 (V)	**Pixel size**	3.5 μm x 3.5 μm
Optical format	57.344 mm	**Shutter type**	Global shutter
Full well capacity	5.6 ke⁻	**Photosensive area**	57.344 mm
Peak QE	57.1% @ 530 nm	**Temporal noise**	8.2 e⁻
Max. SNR	37.4 dB	**Dark Current**	0.8 ke⁻/pixel/s @ 42°C
Max Line rate	120 kHz @ single line, 60 kHz @ dual line	**Dynamic Range**	56.6 dB
Output format	25 ch sub-LVDS	**Chroma**	Mono, RGB color
Channel multiplexing	25/13/7/4	**ADC**	10 bit
Max. Data rate	24 Gbps	**Supply voltage**	3.3 V(analog),1.8 V-3.3 V(IO),1.8 V(digital)
Power consumption	3.2 W	**Package**	168 Pins COB (71.8 mm x 32.0 mm)

Package Drawing



NOTE:

1. GL3516 COLOR 2 lines, Optical Center1(29.25±0.10,9.246±0.10)
   GL3516 MONO 2 lines, Optical Center2(29.25±0.10,9.204±0.10)
2. All tolerances +/-0.1mm unless otherwise noticed



Custom Design

Full Custom

- Customized IC, package, and cover glass
- Chip architecture and detailed design, product testing and reliability experiments

Semi-Custom

- Customize an existing design
- Color filters, micro lenses
- Package type
- Glass cover plate coating
- Chip final test standard