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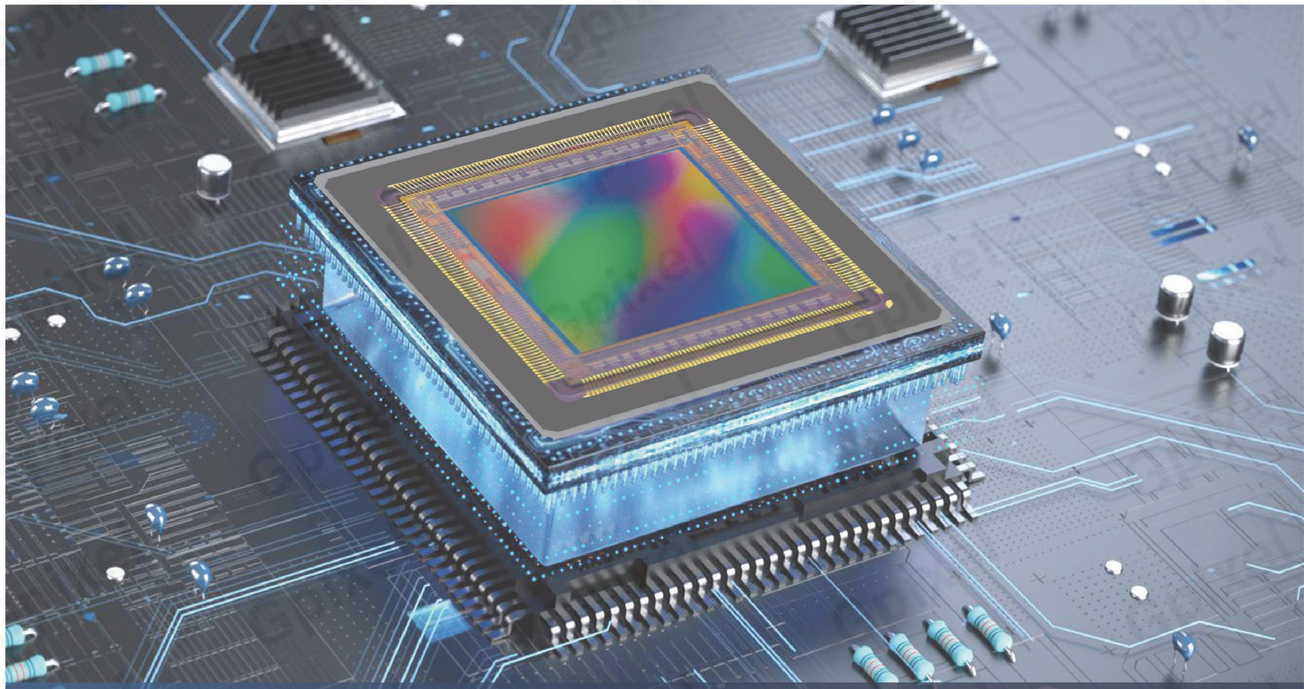
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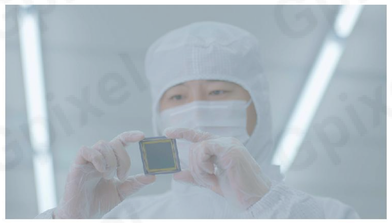
Gpixel



Advanced CMOS Image Sensors

GPIXEL PRODUCTS BROCHURE

+ COMPANY


Founded 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

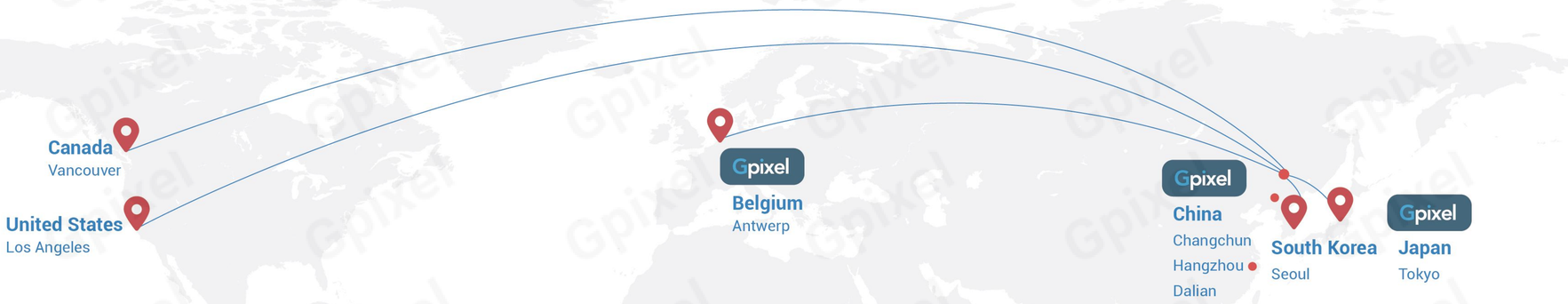
Products
Advanced CMOS image sensors

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 a broad portfolio of products covering automation & inspection, scientific imaging, medical imaging, video & photography, and traffic & transportation.





Global Footprint

Gpixel employees from 12 countries around the world

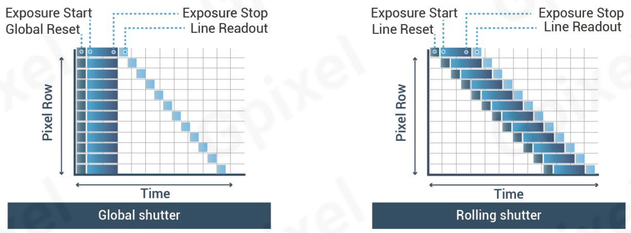


Gpixel

Technology

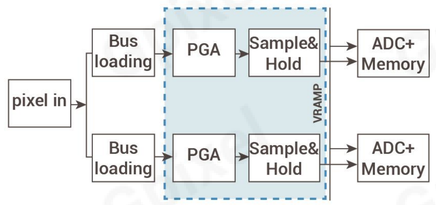
Global Shutter Pixels

- 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.



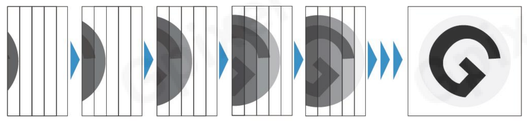
Low Noise, High Speed, High Dynamic Range

- 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.



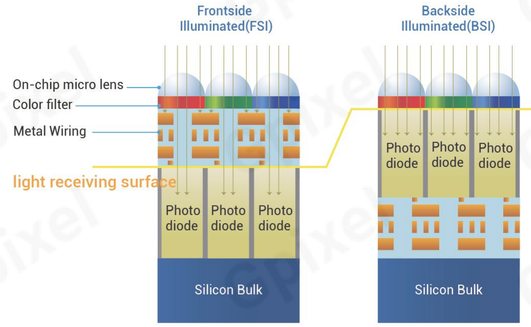
Time Delay and Integration

- 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.



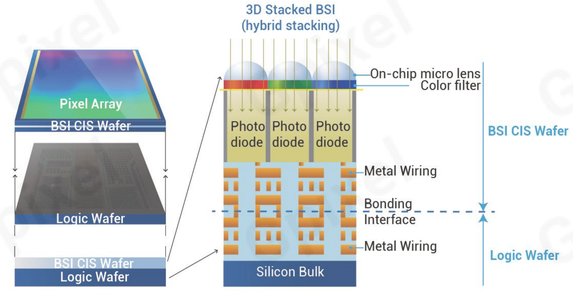
Backside-illumination

- 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.



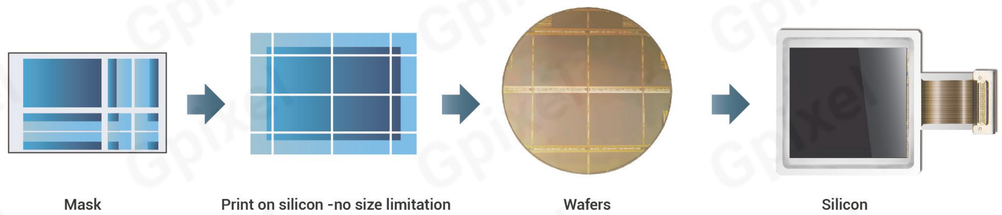
Advanced Wafer Stacking

- 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.



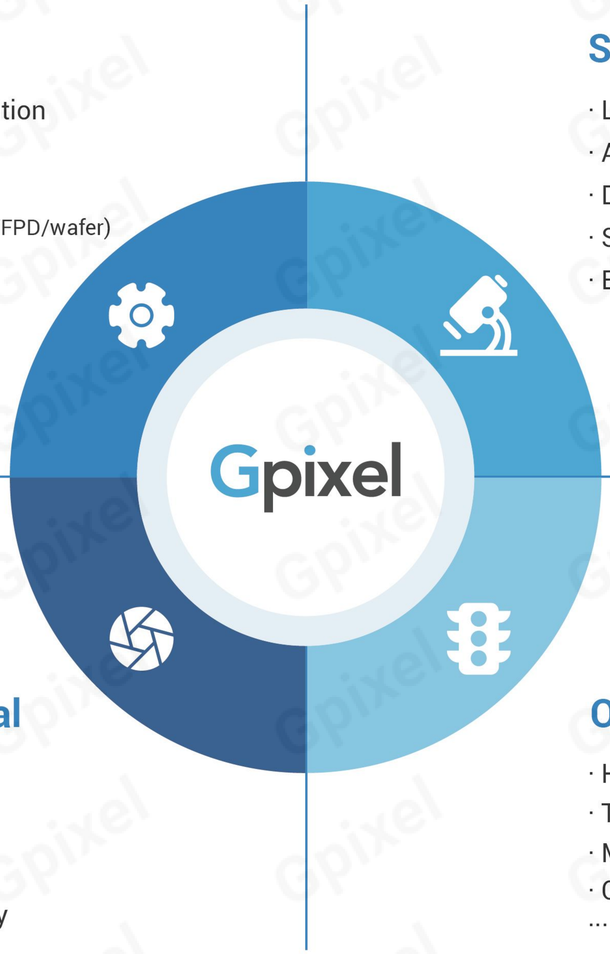
Market Segments

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

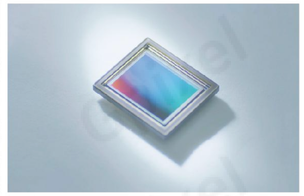
Others

· 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.





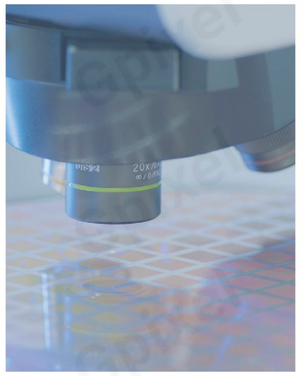




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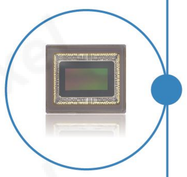
Advanced CMOS Image Sensors





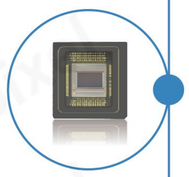
Product Contents

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



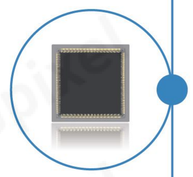
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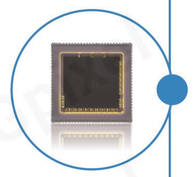
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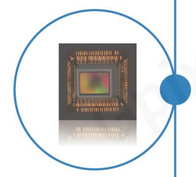
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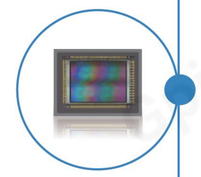
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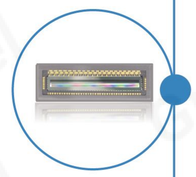
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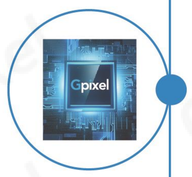
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Gpixel

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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	GMAX4416	GMAX2518	GMAX0505
GMAX4651	GMAX3265	GMAX32103	GMAX32152	

Product Family Features

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

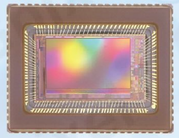
Applications

- 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 a 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

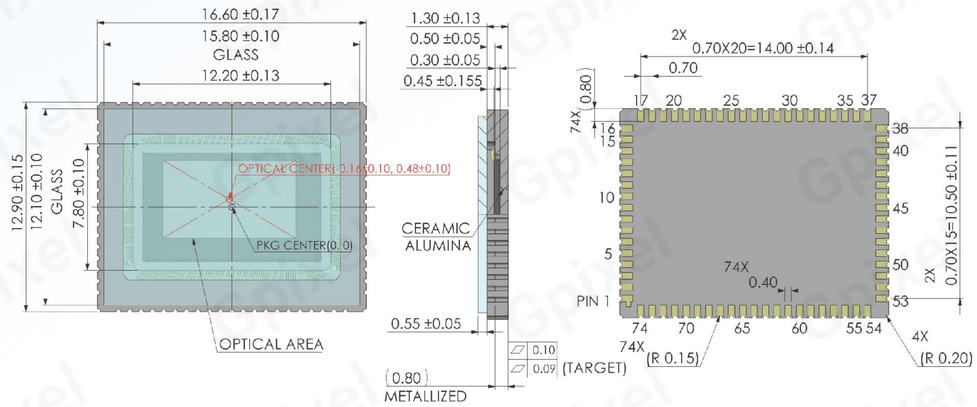
Application

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

Specifications

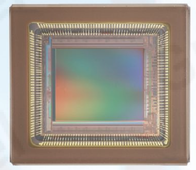
Nr of Active Pixels	2048 (H) x 1200 (V)	**Pixel size**	4.0 µm x 4.0 µm
Optical format	1/1.7"	**Shutter type**	Global shutter
Photosensive area	8.2 mm x 4.8 mm (9.5 mm diameter)	**Full well capacity**	11.6 ke⁻
Peak QE	73.7% @ 550 nm	**Temporal noise**	2.6 e⁻
Parasitic Light Sensitivity	-92.0 dB	**Dark 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 and 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 µm charge-domain global shutter pixel, GMAX3405 achieves a maximum full well capacity of 10 ke⁻ and minimum dark noise of 1.5 e⁻, delivering 68.8 dB linear dynamic range. Red Fox technology delivers QE of 75% @ 540 nm, and a NIR QE of 33% @ 850 nm. GMAX3405 is housed in a 176 pin ceramic LGA packag with outer dimensions 17.6 mm x 15.8 mm, and is pin-compatible with GMAX3412.

Key features and Benefits

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

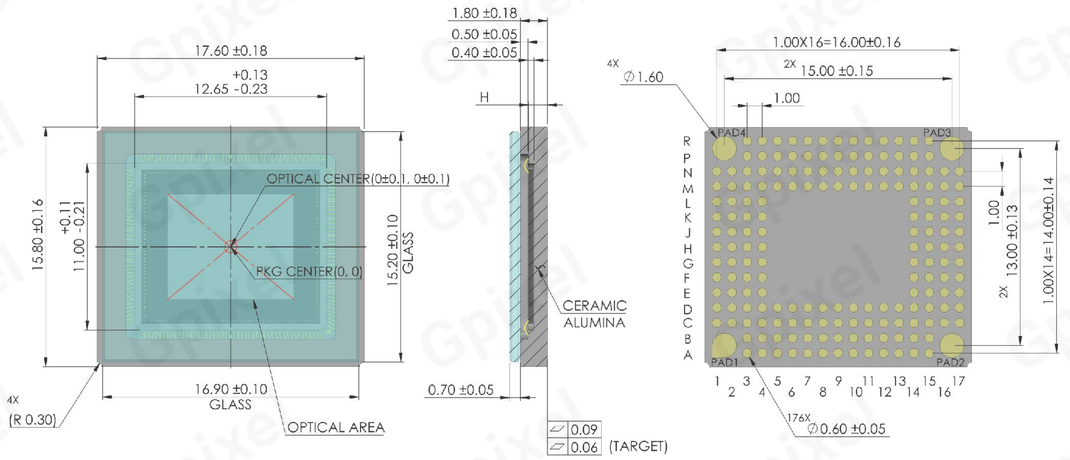
Application

·Automation & Inspection ·Intelligent Transport Systems

Specifications

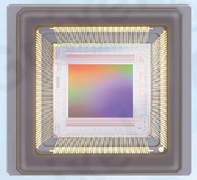
Nr of Active Pixels	2448 (H) x 2048 (V)	**Pixel size**	3.4 µm x 3.4 µm
Optical format	2/3"	**Shutter type**	Global shutter
Photosensive area	8.3 mm x 7.0 mm	**Full well capacity**	10 ke⁻ @ 12-bit and 1x PGA gain
Peak QE	75% @ 540 nm, 33% @ 850 nm	**Temporal noise**	3.6 e⁻ @ 1x PGA gain,1.5 e⁻ @ 16x PGA 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 10 bit and 12 bit output, with frame rate up to 290 fps and 121 fps respectively. It is assembled in a ceramic 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 sequencer operation, allowing reduced system costs and simplied camera development.

Key features and Benefits

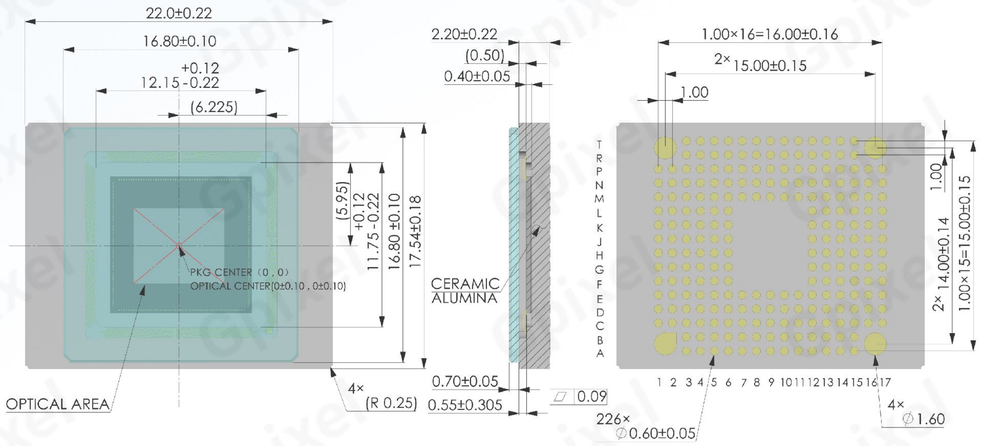
· High resolution in 1/2" optical format
· High data throughput > 26 Gbps
· Low noise global shutter

Application

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

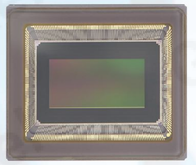
Specifications			
Nr of Active Pixels	2600 (H) x 2160 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	1/2"	**Shutter type**	Global shutter
Photosensive area	6.5 mm x 5.4 mm	**Full well capacity**	6.7 ke$^-$
Peak QE	65.5% @ 500 nm	**Temporal noise**	1.8 e$^-$
Parasitic Light Sensitivity	-80.0 dB	**Dark 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 respectively. It is assembled in a ceramic 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 sequencer operation, allowing reduced system costs and simplified camera development.

Key features and Benefits

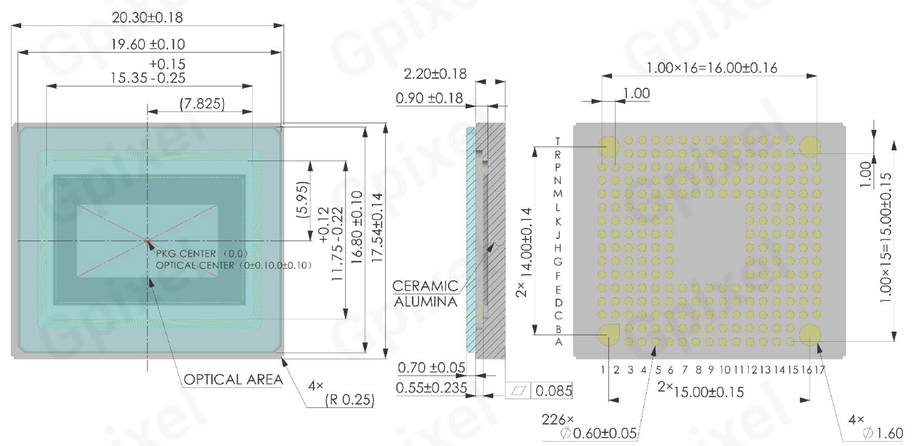
· High resolution in 2/3" optical format
· High data throughput > 26 Gbps
· Low noise global shutter

Application

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

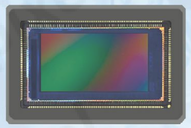
Specifications			
Nr of Active Pixels	4200 (H) x 2160 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	2/3"	**Shutter type**	Global shutter
Photosensive area	10.5 mm x 5.4 mm	**Full well capacity**	6.7 ke$^-$
Peak QE	65.5% @ 500 nm	**Temporal noise**	1.8 e$^-$
Parasitic Light Sensitivity	-80.0 dB	**Dark 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 delivers 9 MP resolution in a wide 1.1" optical format with low noise, charge domain global shutter pixels and frame rate of 65 fps with 12 bit ADC resolution and over 70 dB dynamic range. 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 sided, AR coated cover glass.

Key features and Benefits

· Low noise global shutter
· Excellent PLS and angular response
· On-chip color offset calibration

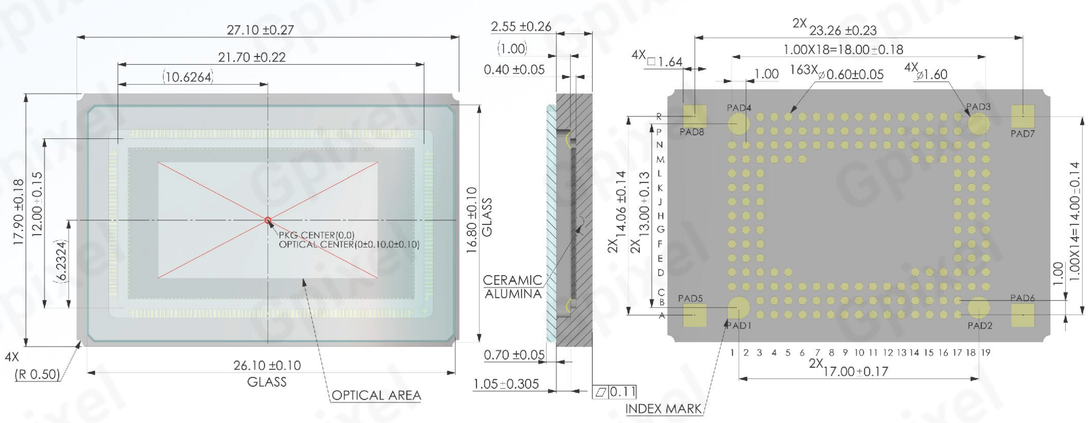
Application

·Automation & Inspection
·Intelligent Transport Systems

Specifications

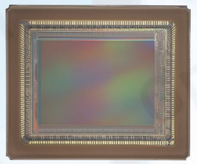
Nr of Active Pixels	4096 (H) x 2160 (V)	**Pixel size**	3.8 µm x 3.8 µm
Optical format	1.1"	**Shutter type**	Global shutter
Photosensive area	15.6 mm x 8.2 mm	**Full well capacity**	11.2 ke⁻
Peak QE	61.7% @ 540 nm	**Temporal noise**	2.2 e⁻
Parasitic Light Sensitivity	-92.0 dB	**Dark Current**	31.5 e⁻/pixel/s @ 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 X 3072 effective pixels with frame rates up to 128/60 fps in 10/12-bit mode with sub-LVDS interface and 30 fps over the alternative 4 MIPI DPHY channels. Based on a high-performance 3.4 µm charge-domain global shutter pixel, GMAX3412 achieves a maximum full well capacity of 10 ke- and minimum dark noise of 1.5 e-, delivering 68.8 dB linear dynamic range. Red Fox technology delivers QE of 75% @540 nm, and NIR QE of 33% @850 nm. GMAX3412 is housed in a 176 pin ceramic LGA package with outer dimensions 22.93 mm x 19.39 mm, and is pin-compatible with GMAX3405.

Key features and Benefits

· NIR enhanced
· Low noise global shutter
· High dynamic range

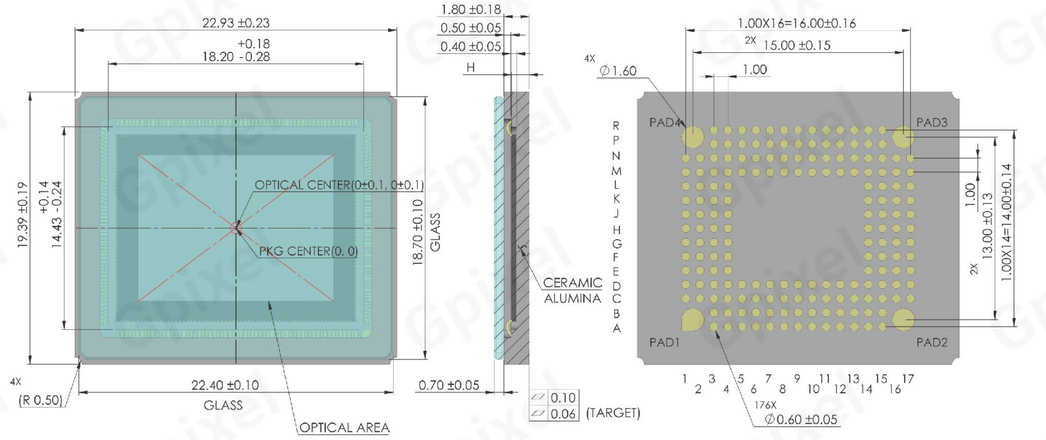
Application

·Automation & Inspection
·Intelligent Transport Systems

Specifications

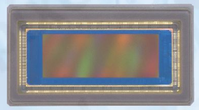
Nr of Active Pixels	4096 (H) x 3072 (V)	**Pixel size**	3.4 µm x 3.4 µm
Optical format	1.1"	**Shutter type**	Global shutter
Photosensive area	14.0 mm x 10.5 mm	**Full well capacity**	10 ke⁻ @ 12-bit and 1x PGA gain
Peak QE	75% @ 540 nm, 33% @ 850 nm	**Temporal noise**	1.5 e⁻ at gain x16,3.6 e⁻ at gain 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 offers 12.7 MP resolution in a 4/3" optical format with a wide aspect ratio, providing optimal coverage of the field of view in applications such as Intelligent Transportation Systems (ITS), logistics, and parcel sorting. GMAX3413 supports on-chip color offset calibration, LED flicker mitigation, multiple region HDR, and OTP functions. 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 provides 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

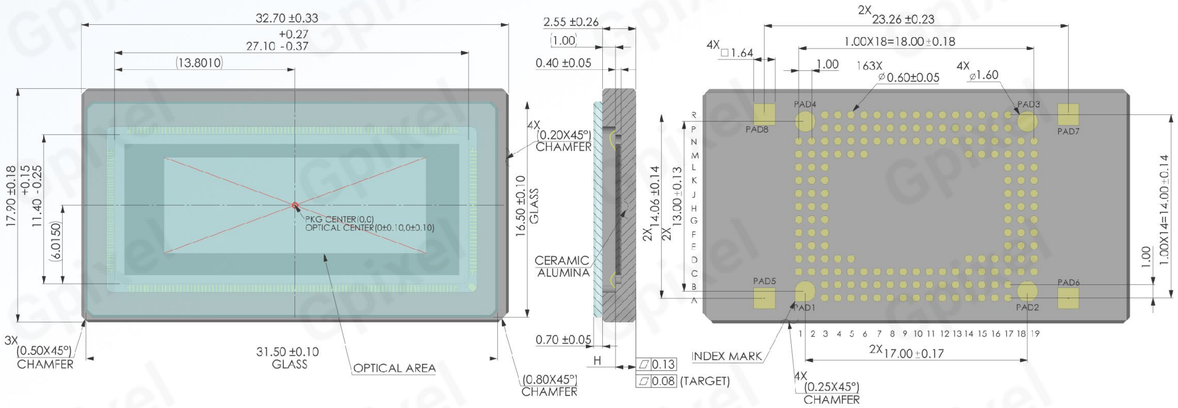
Application

·Automation & Inspection ·Intelligent Transport Systems

Specifications

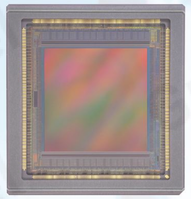
Nr of Active Pixels	5900 (H) x 2160 (V)	**Pixel size**	3.4 µm x 3.4 µm
Optical format	4/3"	**Shutter type**	Global shutter
Photosensive area	20.1 mm x 7.3 mm	**Full well capacity**	8.6 ke$^-$
Peak QE	62.7% @ 540 nm	**Temporal noise**	2.31 e$^-$
Parasitic Light Sensitivity	< -92.0 dB	**Dark Current**	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



GMAX4416

16MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX4416 is a 1.6" optical format square CMOS image sensor with 4096 x 4096 (16.7 MP) effective pixels. Using advanced processing technology, the 4.4 µm global shutter pixel achieves a maximum full well capacity of 15 ke$^-$ and minimum dark noise of 3.0 e$^-$, delivering 73.9 dB linear dynamic range. GMAX4416 is housed in 152-pin ceramic µPGA package with outer dimensions of 31.70 mm x 30.40 mm. GMAX4416 can reach 80 fps in 12-bit standard high-speed mode utilizing 32 pairs sub-LVDS. It also supports 2x2 binning and a 2x2 binning HDR mode with frame rates of 42 fps and 80 fps respectively.

Key features and Benefits

- Square format
- Dual Gain HDR
- High sensitivity
- High frame rate

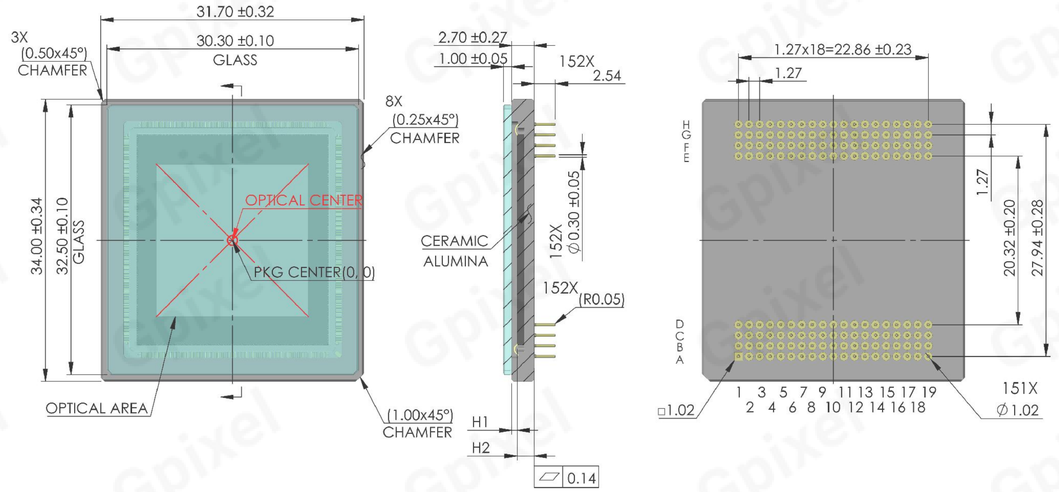
Application

·Automation & Inspection ·Life Sciences ·Microscopy ·Motion Capture

Specifications

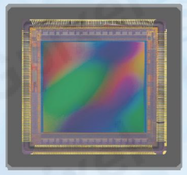
Nr of Active Pixels	4096 (H) x 4096 (V)	**Pixel size**	4.4 µm x 4.4 µm
Optical format	1.6 " (25.5 mm)	**Shutter type**	Global shutter
Photosensive area	18.0 mm x 18.0 mm	**Full well capacity**	15 ke$^-$
Peak QE	70.5% @ 550 nm	**Temporal noise**	3.0 e$^-$
Parasitic Light Sensitivity	-91 dB	**Dark Current**	< 5 e$^-$/pixel/s @ 28℃
Angular response	> 15 (80% response)	**Dynamic Range**	73.9 dB @HDR/68.7 dB @High speed mode/76.9 dB @Bin HDR
Max. SNR	41.7 dB	**ADC**	12 bit
Max Frame rate	42 fps @ HDR /80 fps @ High speed mode /80 fps @ Binning HDR	**Channel multiplexing**	16/14/12/10/8/6/4/2/1
Output format	32 pairs Sub-LVDS	**Chroma**	Mono
Max. Data rate	50 MHz	**Supply voltage**	3.3V (analog), 1.8V-3.3V (IO), 1.2V (digital)
Power consumption	<1.5 W	**Package**	152 pins µPGA (31.7 mm x 34.0 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 running at 960 MHz, the sensor outputs a maximum data rate of 30.72 Gbps, achieving a maximum frame rate of 139 fps in 10 bit mode and 64 fps in 12 bit mode.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 in a 1" optical format
· Low noise global shutter
· Pin-compatible with GMAX0505/2509/2505

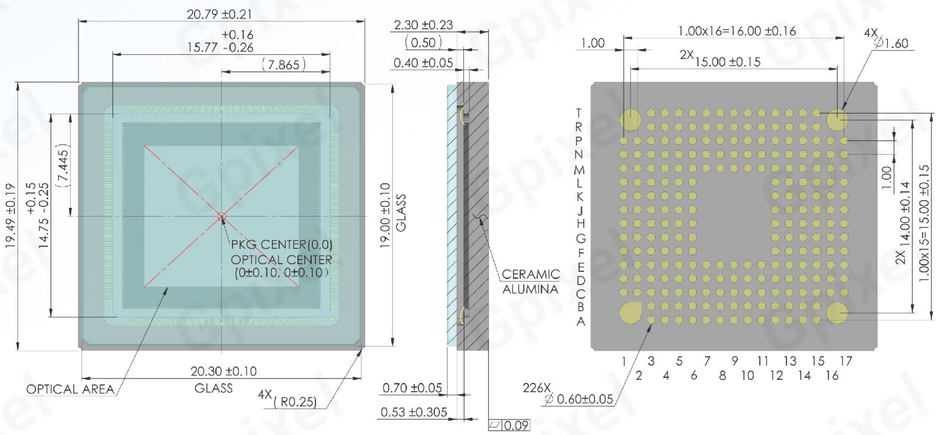
Application

·Automation & Inspection ·Logistic & Positioning ·Metrology

Specifications

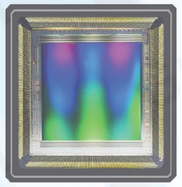
Nr of Active Pixels	4508 (H) x 4096 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	1"	**Shutter type**	Global shutter
Photosensive area	11.3 mm x 10.2 mm	**Full well capacity**	8.0 ke⁻
Peak QE	64.0% @ 520 nm	**Temporal noise**	1.7 e⁻
Parasitic Light Sensitivity	-80 dB	**Dark Current**	6.5 e⁻/pixel/s @ 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 offers 26 MP resolution in a square 1.1" optical format using a 2.5 µm charge domain global shutter pixel. Despite its small pixel pitch, GMAX0505 achieves more than 65% peak QE and dynamic range up to 65.8 dB. The optional Red Fox NIR enhanced version of the sensor delivers 33% QE at 850 nm. GMAX0505 provides excellent angular response thanks to the latest light pipe technology, and with optimized tungsten shielding structure on top of the pixel's memory node, the sensor's shutter efficiency is more than 80 dB. GMAX0505 supports 10 bit and 12 bit output modes and a maximum frame rate of 150 fps. The sensor is assembled in a 226-pin ceramic LGA package for easy integration and mass production.

Key features and Benefits

· 2.5 µm global shutter pixel
· High resolution in a 1.1"optical format
· Square optical format
· NIR enhanced option with Red Fox technology
· High speed and Good PLS
· Pin-compatible with GMAX2505, GMAX2509 and GMAX2518

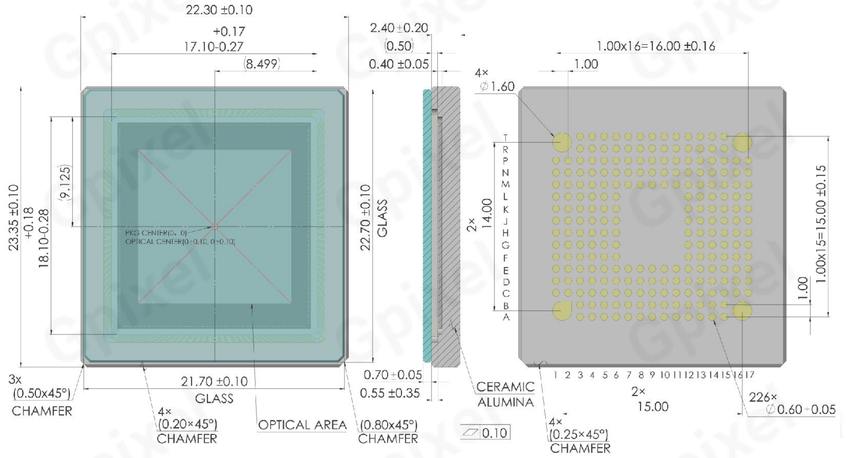
Application

·Automation & Inspection ·Logistic & Positioning ·Metrology

Specifications

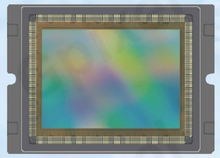
Nr of Active Pixels	5120 (H) x 5120 (V)	**Pixel size**	2.5 µm x 2.5 µm
Optical format	1.1"	**Shutter type**	Global shutter
Photosensive area	12.8 mm x12.8 mm	**Full well capacity**	6.5 ke⁻
Peak QE	65.5% @ 500 nm	**Temporal noise**	1.6 e⁻
Parasitic Light Sensitivity	-80 dB	**Dark Current**	1.0 e⁻/pixel/s @ 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 51 MP CMOS image sensor delivering 8k video at 30 fps in a 35 mm optical format, making it ideal for applications in broadcast imaging, surveillance, aerial mapping, inspection, and biometrics. It's large 4.6 µm pixel 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. 12 bit data is delivered via 24 pairs of sub-LVDS 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.

Key features and Benefits

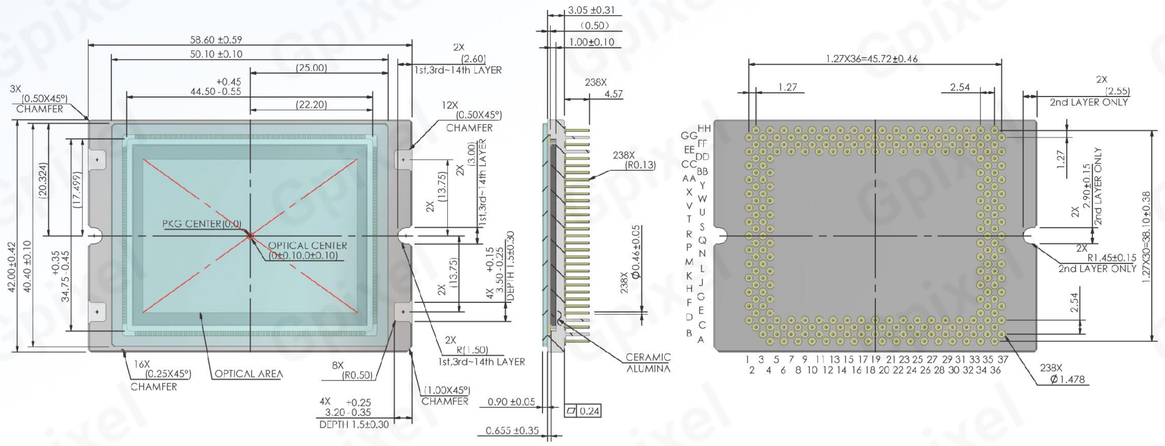
· High resolution in a 35 mm optical format
· Large, high sensitivity pixels
· Low noise global shutter

Application

·Automation & Inspection

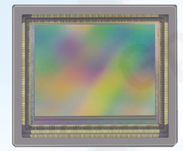
Specifications			
Nr of Active Pixels	8424 (H) x 6032 (V)	**Pixel size**	4.6 µm x 4.6 µm
Optical format	35mm Full Frame	**Shutter type**	Global shutter
Photosensive area	38.8 mm x 27.8 mm	**Full well capacity**	18 ke⁻
Peak QE	67.1% @ 510 nm	**Temporal noise**	7.6 e⁻
Parasitic Light Sensitivity	-92 dB	**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 65 MP CMOS image sensor 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 10 bit operation for a maximum 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

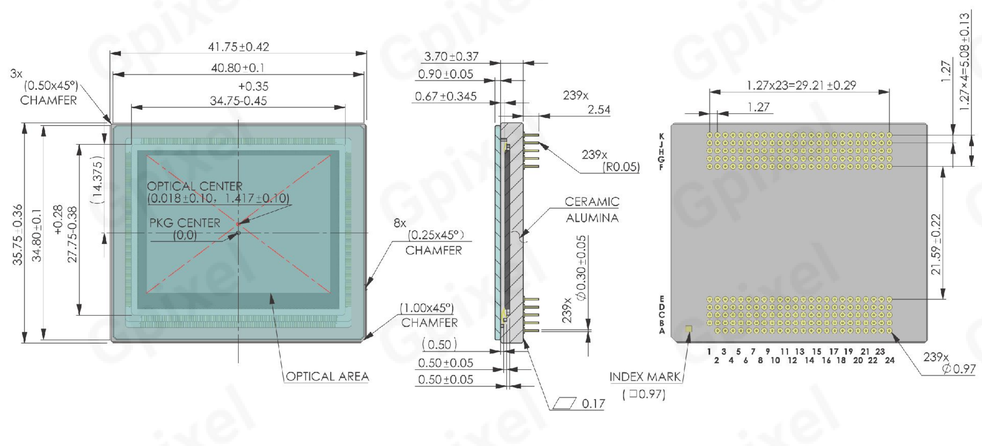
· High resolution in compact optical format
· Low noise global shutter
· High speed and good PLS

Application

·Automation & Inspection

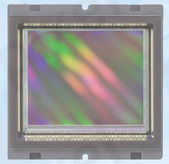
Specifications			
Nr of Active Pixels	9344 (H) x 7000 (V)	**Pixel size**	3.2 µm x 3.2 µm
Optical format	2.3"	**Shutter type**	Global shutter
Photosensive area	29.9 mm x 22.4 mm	**Full well capacity**	10.9 ke⁻
Peak QE	65.3% @ 500 nm	**Temporal noise**	1.9 e⁻
Parasitic Light Sensitivity	-83.5 dB	**Dark 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 103 MP CMOS image sensor in a 2.9" optical format. 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 of -83.9 dB. The sensor supports 12 bit operation for a maximum 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, aerial imaging, surveillance, biometrics, document imaging and flat panel inspection.

Key features and Benefits

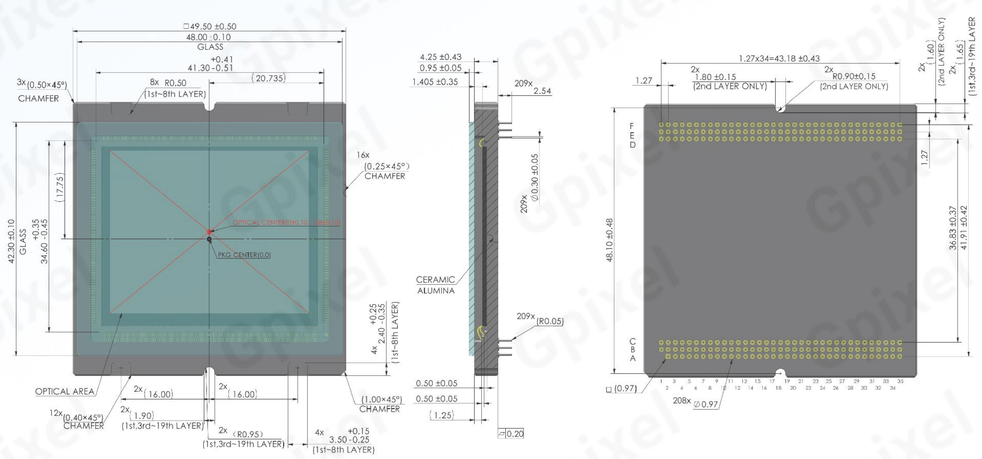
· High resolution in compact optical format
· High data throughput
· High speed and good PLS

Application

·Automation & Inspection
·Aerial Imaging

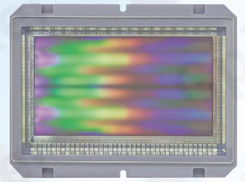
Specifications			
Nr of Active Pixels	11276 (H) x 9200 (V)	**Pixel size**	3.2 µm x 3.2 µm
Optical format	2.9"	**Shutter type**	Global shutter
Photosensive area	36.1 mm x 29.4 mm	**Full well capacity**	9 ke⁻
Peak QE	66.9% @ 500 nm	**Temporal noise**	2.8 e⁻
Parasitic Light Sensitivity	-83.5 dB	**Dark Current**	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



GMAX32152

152MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GMAX32152 is a 152 MP CMOS image sensor in a wide 3.7" optical format. 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 of -83.5 dB. The sensor supports 12 bit operation for a maximum frame rate of 16 fps. Channel multiplexing of the 38 pairs of sub-LVDS 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, aerial imaging, and document imaging.

Key features and Benefits

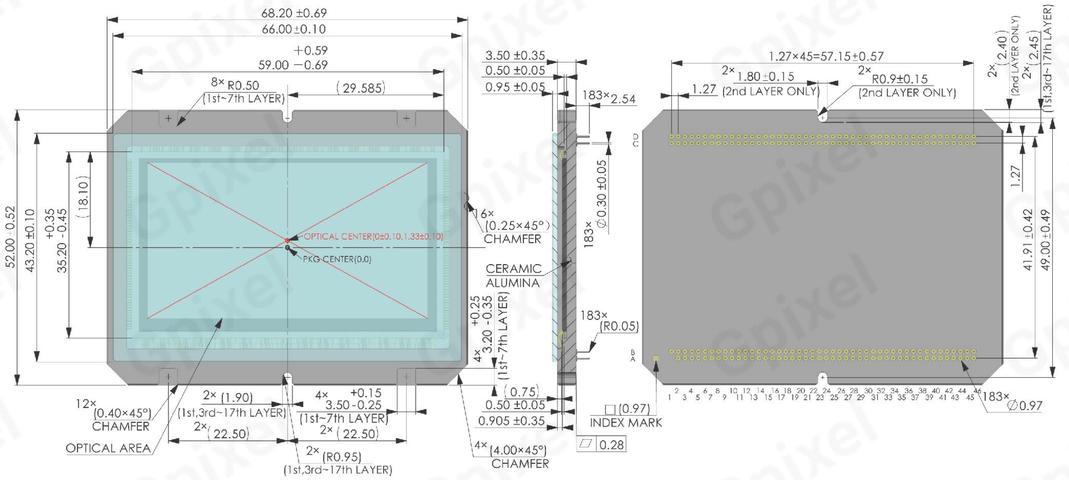
· Highest resolution global shutter
· Low noise global shutter
· 1.8:1 wide aspect ratio

Application

·Automation & Inspection
·Aerial Imaging
·Document Imaging

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



Gpixel

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

Area Scan CMOS Image Sensor

The GSPRINT series is Gpixel's high-speed global shutter product family, with resolutions ranging from 2 MP to 21MP and frame rates up to 3462 fps.

GSPRINT6502BSI GSPRINT4502 GSPRINT4510 GSPRINT4521

Product Family Features

- Global Shutter
- High speed
- 2MP-21MP resolution
- Low noise

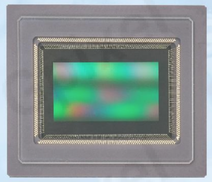
Applications

- Automation & Inspection
- High-throughput scientific imaging
- Slow motion video
- 3D Laser Profiling



GSPRINT6502BSI

2MP GLOBAL SHUTTER CMOS IMAGE SENSOR



GSPRINT6502BSI is a backside illuminated global shutter CMOS image sensor with 2048 (H) x 1152 (V) pixels, each 6.5 µm square, providing a wide format and compatibility with 1" optics. The combination of backside illumination and a large 6.5 µm pixel maximize light collection in high-speed imaging applications including 3D laser profiling and scientific imaging. With 10-bit output and 32 pairs of sub-LVDS outputs each operating at 1.2 Gbps, the GSPRINT6502BSI achieves 1500 frames per second. Up to 8 vertically oriented regions of interest can be defined to operate the sensor at increased frame rates. For applications in which the maximum frame rate is not required, multiplexing modes are available to reduce the number out output channels by any multiple of 2.

Key features and Benefits

· BSI · Multi-slope HDR · High frame rate · High speed · High QE

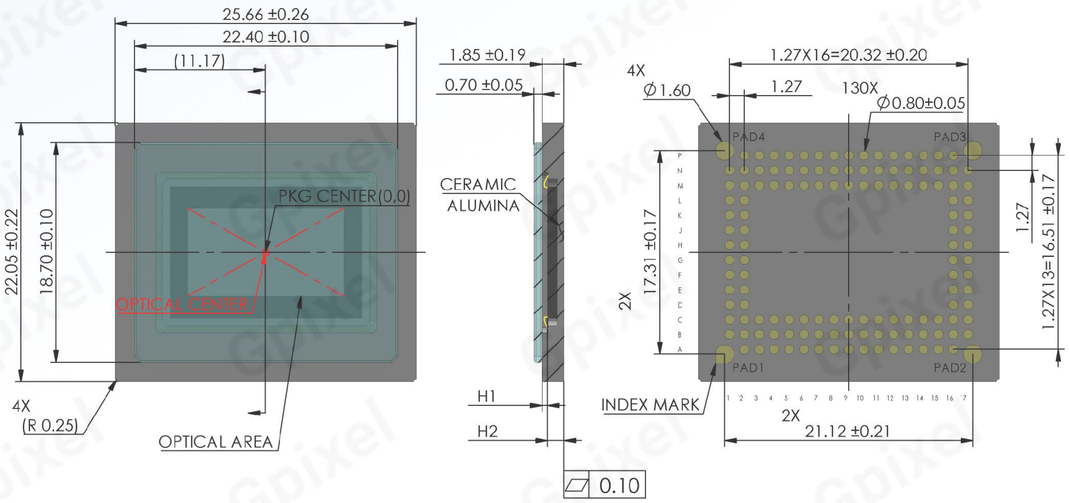
Application

·Automation & Inspection ·Spectroscopy ·Life Sciences ·Microscopy ·High Speed Imaging

Specifications

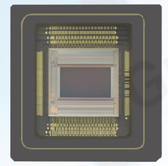
Nr of Active Pixels	2048 (H) x 1152(V)	**Pixel size**	6.5 µm x 6.5 µm
Optical format	1" (15.3 mm)	**Shutter type**	Global shutter
Photosensive area	13.3 mm x 7.5 mm	**Full well capacity**	20.0 ke^-
Peak QE	>80 %	**Temporal noise**	24.3 e^-
Angular response	50°(60% response)	**Dynamic Range**	57 dB
Max. SNR	TBD	**ADC**	10 bit
Max Frame rate	1500 fps,2941 fps @ 1x2 binned	**Channel multiplexing**	Yes(any multiple of 2)
Output format	32 pairs LVDS	**Chroma**	Mono
Max. Data rate	38.4 Gbps	**Supply voltage**	3.6V & 3.3V (analog), 1.8V (I/O), 1.2V (digital)
Power consumption	<1.9 W	**Package**	130pins LGA (25.66 mm x 22.05 mm)

Package Drawing



GSPRINT4502

2.4MP GLOBAL SHUTTER HIGH SPEED IMAGE SENSOR



GSPRINT4502 is a 2MP (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 2x2 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 3462 fps at 8 bits per pixel and full resolution and over 10000 fps in 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

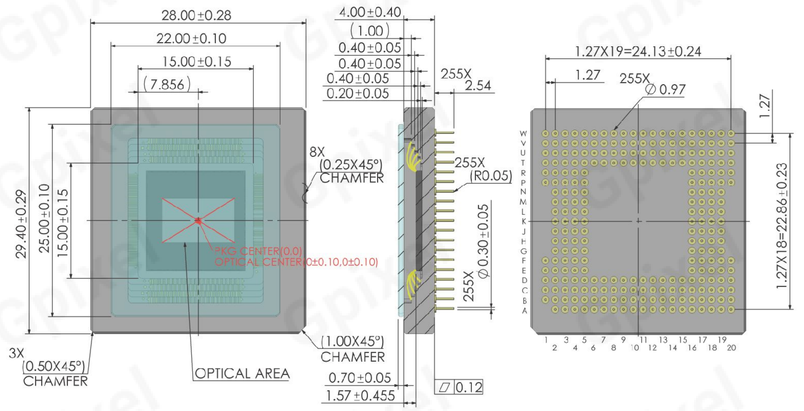
Application

·Automation & Inspection ·Cinematography ·High Speed Imaging

Specifications

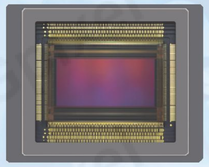
Nr of Active Pixels	2048 (H) x 1216 (V)	**Pixel size**	4.5 µm x 4.5 µm
Optical format	2/3"	**Shutter type**	Global shutter
Photosensive area	9.21 mm x 5.47 mm	**Full well capacity**	>30 ke^-
Peak QE	65.7% @ 515 nm	**Temporal noise**	3.8 e^-
Parasitic Light Sensitivity	-84.6 dB	**Dark Current**	21 e^-/pixel/s @ 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. GSPRINT4510 is well suited for many high-speed applications such as slow motion video capture, drone-mounted videography, and 3D laser profiling.

Key features and Benefits

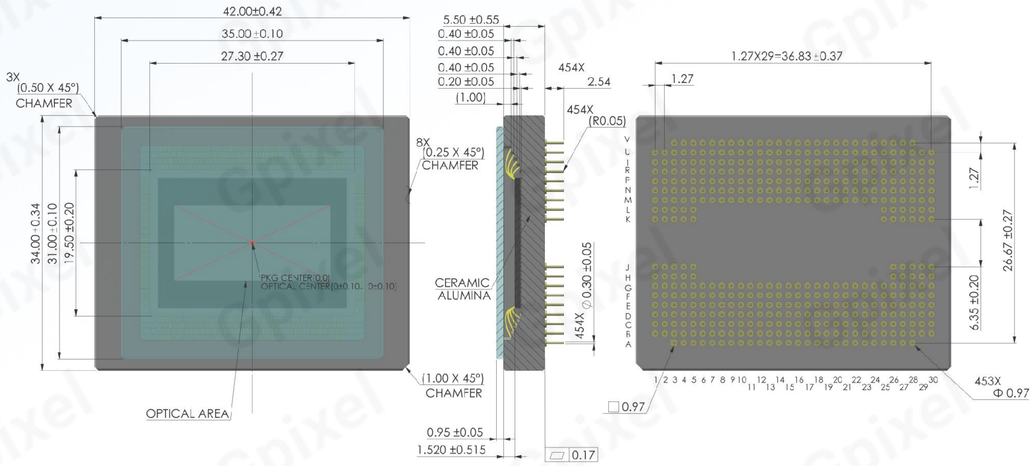
· High Frame Rate
· Low noise Global Shutter
· Multi-slope HDR

Application

·Automation & Inspection
·Cinematography
·High Speed Imaging

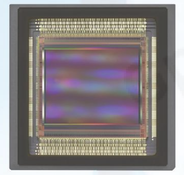
Specifications			
Nr of Active Pixels	4608 (H) x 2176 (V)	**Pixel size**	4.5 µm x 4.5 µm
Optical format	4/3" (MFT)	**Shutter type**	Global shutter
Photosensive area	20.7 mm x 9.79 mm	**Full well capacity**	>30 ke⁻
Peak QE	>67% @ 550 nm	**Temporal noise**	4 e⁻
Parasitic Light Sensitivity	<-86 dB	**Dark 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



GSPRINT4521

21MP GLOBAL SHUTTER HIGH SPEED IMAGE SENSOR



GSPRINT4521 is a 21MP (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⁻FWC, less than 3 e⁻rms read noise and >69 dB dynamic range, optionally increased to 81 dB with a dual gain HDR mode. In 8 bit mode, the sensor delivers 1000 fps. 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. 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 high-throughput life science imaging.

Key features and Benefits

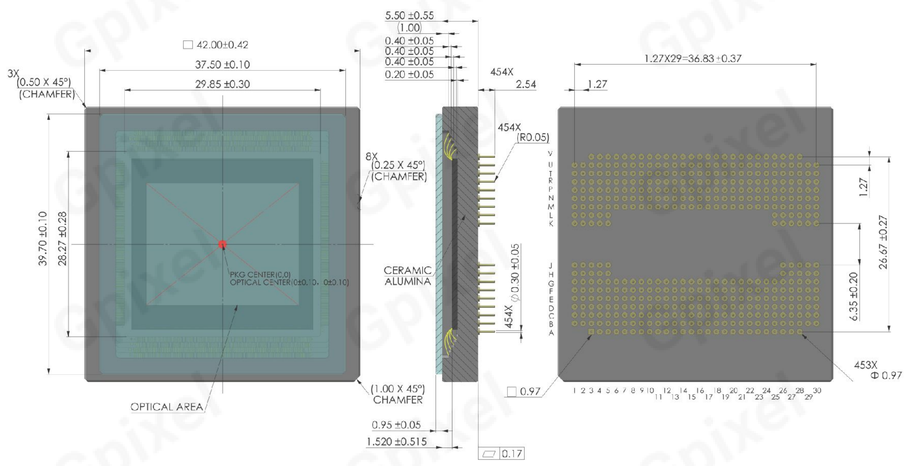
· High Frame Rate
· Low noise Global Shutter
· dual gain HDR mode

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%. Optional Pulsar technology extends sensitivity into the soft x-ray region. Primary applications include scientific imaging, medical imaging, spectroscopy, fluorescence imaging, astronomy, high energy physics, and high-end surveillance.

GSENSE2020	GSENSE2020BSI
GSENSE400	GSENSE400BSI
GSENSE4040	GSENSE4040BSI
GSENSE6060	GSENSE6060BSI
GSENSE3243BSI	GSENSE6510BSI
GSENSE2011	GSENSE1081BSI

Product Family Features

- Large Format
- BSI
- High Dynamic
- Low Noise

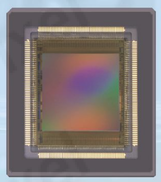
Applications

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



GSENSE2020

4MP SCIENTIFIC CMOS IMAGE SENSOR



GSENSE2020 is a 4MP resolution scientific CMOS image sensor, capable of operating with either global or rolling shutter. The sensor's six transistor (6T) pixel design on a 6.5 µm pitch has a very low readout noise of 2.1 e^- in rolling shutter HDR mode with maximum frame rate of 47 fps, and up to 370 fps in global shutter mode. With dual gain HDR the sensor outputs two separate images after each exposure which can be combined off-chip to achieve dynamic rate up to 87 dB.

Key features and Benefits

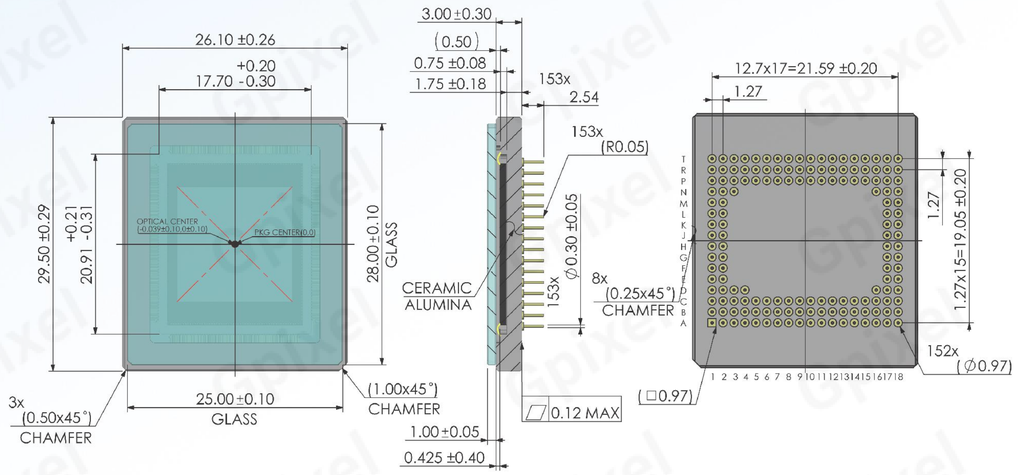
· Scientific CMOS
· Peak QE of 72%
· Low noise, low power for long expsoure modes

Application

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

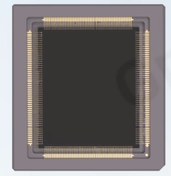
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	6.5 µm x 6.5 µm
Optical format	1.2"	**Shutter type**	Rolling & Global shutter
Photosensive area	13.3 mm x 13.3 mm	**Input clock rate**	50 MHz
Peak QE	72% @ 595 nm	**Full well capacity**	45 ke^-
Dark Current	13 e^-/pixel/s @ 30°C	**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^-, and peak QE of 95%. The sensor supports correlated multiple sampling (CMS), further reducing the read noise to 1.2 e^- with 2-CMS operation. In addition, GSENSE2020BSI is pin-compatible with GSENSE2020 and GSENSE2011, allowing easy hardware integration and fast time-to-market.The GSENSE2020BSI is an ideal solution for life sciences applications including fluorescence microscopy.

Key features and Benefits

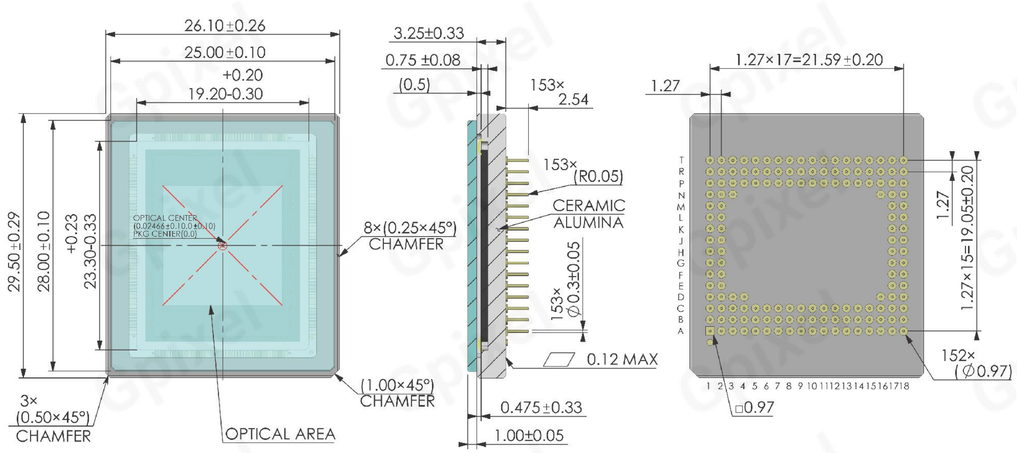
· Scientific CMOS
· Peak QE of 95%
· Low noise, low power for long expsoure modes

Application

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

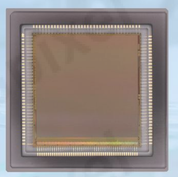
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	6.5 µm x 6.5µm
Optical format	1.2"	**Shutter type**	Rolling shutter
Photosensive area	13.3 mm x 13.3 mm	**Input clock rate**	600 MHz
Peak QE	95% @ 560 nm	**Full well capacity**	55 ke^-
Dark Current	0.07 e^-/pixel/s @ 30 °C	**Temporal 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 4MP resolution CMOS image sensor utilizing an 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's peak QE is 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

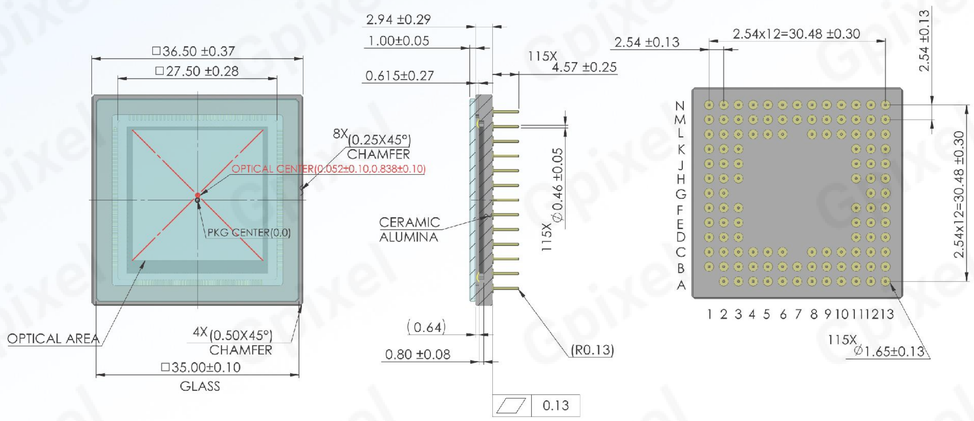
· Peak QE of 58.2%
· Low noise
· High dynamic range

Application

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

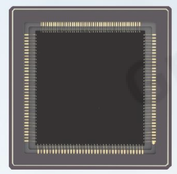
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	11 μm x 11μm
Optical format	2"	**Shutter type**	Rolling shutter
Photosensive area	22.5 mm x 22.5 mm	**Input clock rate**	20 MHz-30MHz
Peak QE	58% @ 600nm	**Full well capacity**	90 ke^-
Dark Current	0.15 e^-/pixel/s @ -20°C	**Temporal 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 backside illuminated scientific 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 sensor's peak QE is 95% for exceptional sensitivity.

Key features and Benefits

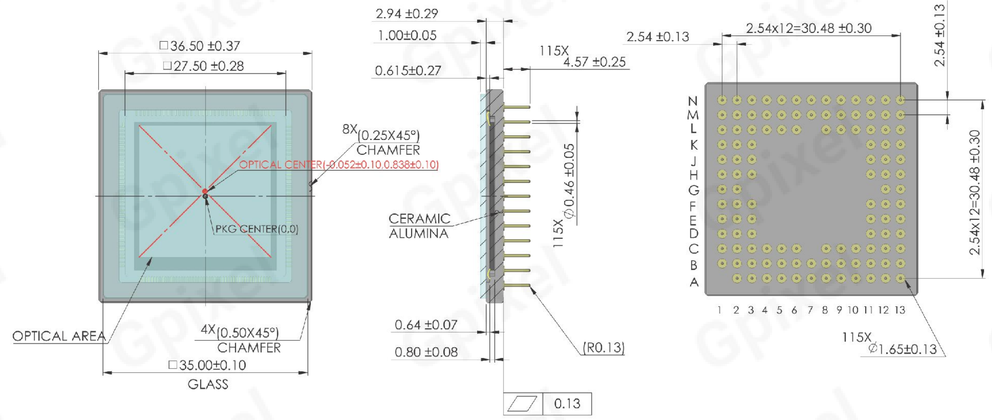
· Backside Illumination scientific CMOS
· Peak QE of 95%
· Low noise, low power for long exposure modes

Application

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

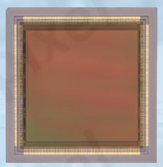
Specifications			
Nr of Active Pixels	2048 (H) x 2048 (V)	**Pixel size**	11 μm x 11 μm
Optical format	2"	**Shutter type**	Rolling shutter
Photosensive area	22.5 mm x 22.5 mm	**Input clock rate**	25 MHz
Peak QE	95% @ 570 nm	**Full well capacity**	91 ke^-
Dark Current	0.27 e^-/pixel/s @ -40°C	**Temporal 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 16.8MP resolution CMOS image sensor. With a five transistor (5T) HDR pixel design on a 9 μm pitch, the sensor can achieve 3.7 e^- dark noise and 74 ke^- FWC simultaneously in HDR mode. It supports 2x2 charge binning in which frame rate is quadrupled. GSENSE4040 is offered in two variants: 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 applications; while CMT is a monochrome sensor with microlens array and sealed with D263T glass lid with anti-reflective coating on both sides, ideal for medical imaging and astronomy applications.

Key features and Benefits

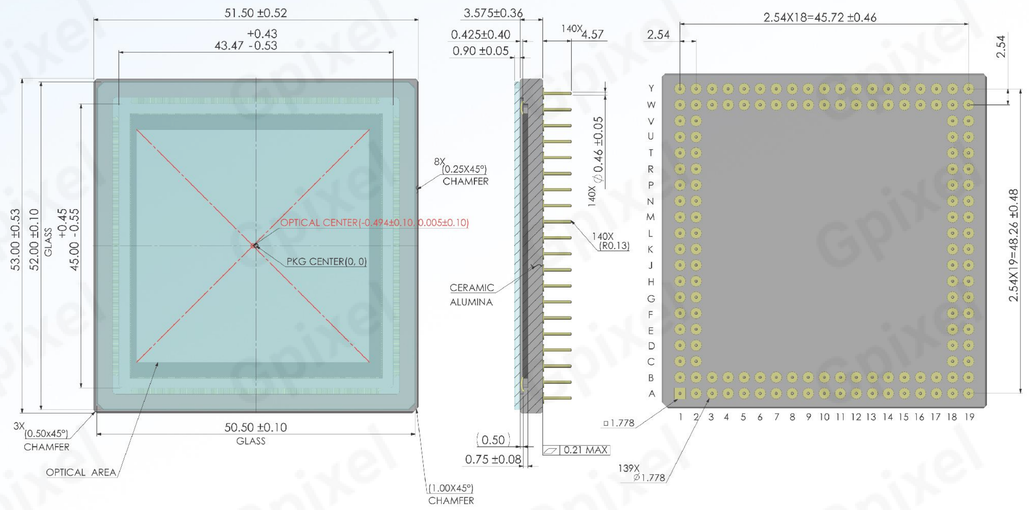
· Peak QE of 74%
· Large format
· High dynamic range

Application

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

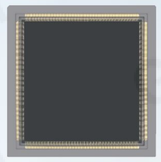
Specifications			
Nr of Active Pixels	4096 (H) x 4096 (V)	**Pixel size**	9 μm x 9 μm
Optical format	3.3"	**Shutter type**	Rolling shutter
Photosensive area	36.864 mm x 36.864 mm	**Input clock rate**	50 MHz
Peak QE	74% @ 600nm	**Full well capacity**	>70 ke^-
Dark Current	12.2 e^-/pixel/s @ 25°C	**Temporal 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 backside illuminated scientific 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 GSENSE4040 for fast and easy integration.

Key features and Benefits

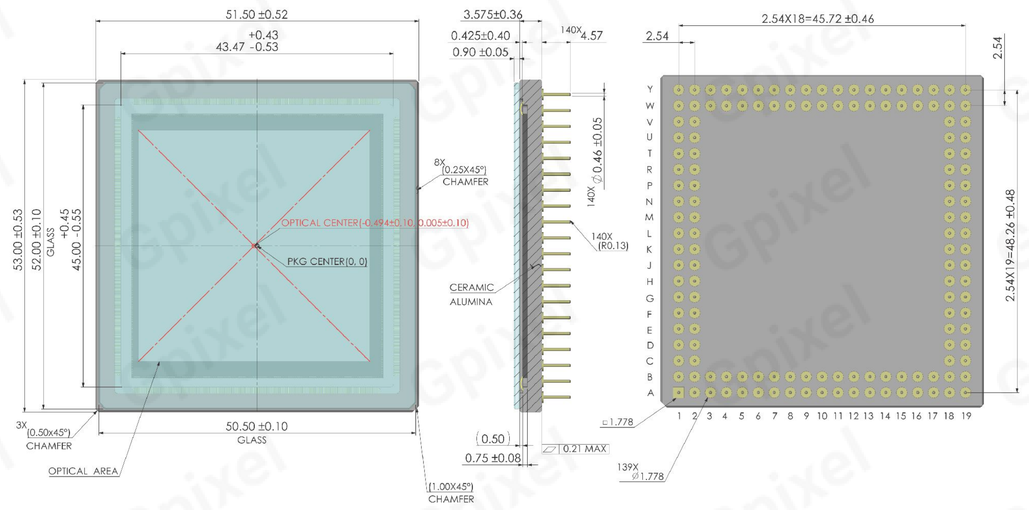
· Large format BSI scientific CMOS
· Low readout noise

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. 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 compared to 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

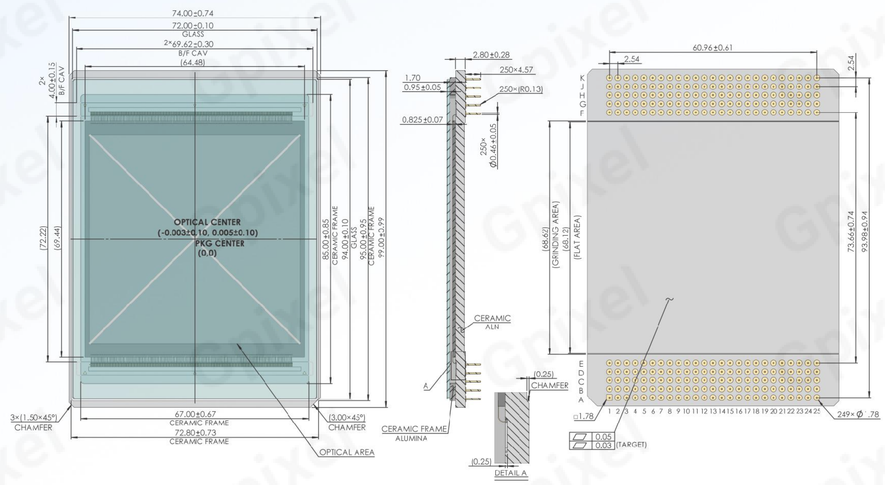
Application

· 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 a backside illuminated scientific CMOS image sensor 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. The Aluminum Nitride package of GSENSE6060BSI provides 10x thermal conductivity compared to the traditional Alumina package, as well as excellent flatness both at the room temperature and deep-cooled temperatures. GSENSE6060BSI is equipped with a removable glass lid.

Key features and Benefits

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

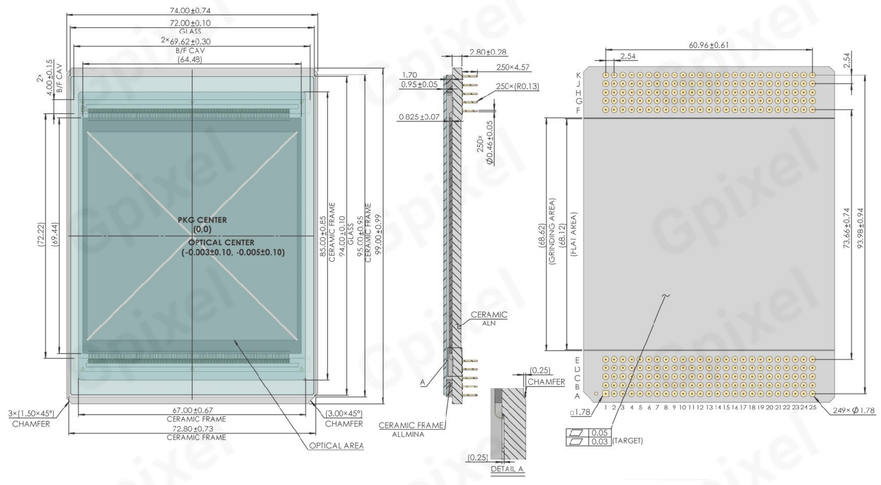
Application

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

Specifications

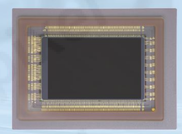
Nr of Active Pixels	6144 (H) x 6144 (V)	**Pixel size**	10 µm x 10 µm
Optical format	5.4"	**Shutter type**	Rolling shutter
Photosensive area	61.44 mm x 61.44 mm	**Input clock rate**	35 MHz @ 12 bit, 30 MHz @ 14 bit
Peak QE	95% @ 580 nm	**Full well capacity**	95 ke⁻
Dark Current	0.019 e⁻/pixel/s @ -53°C	**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 0°C.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

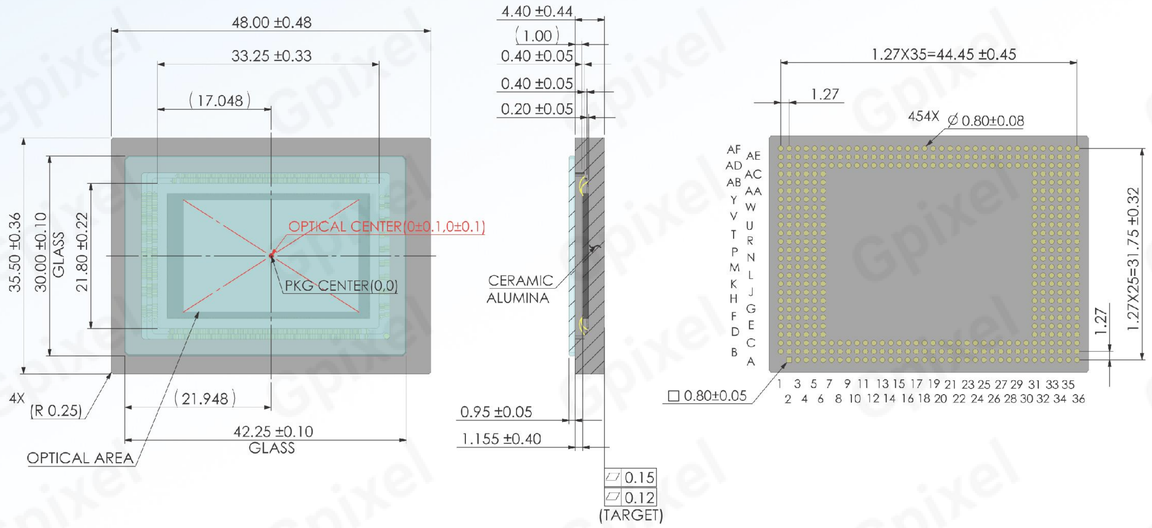
· Stacked BSI
· High sensitivity
· Low noise
· High dynamic range
· Multi-slope HDR
· Dual Gain HDR

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-speed modes, an 8-bit mode reaching 500 fps and an 11-bit mode reaching 166 fps.

Key features and Benefits

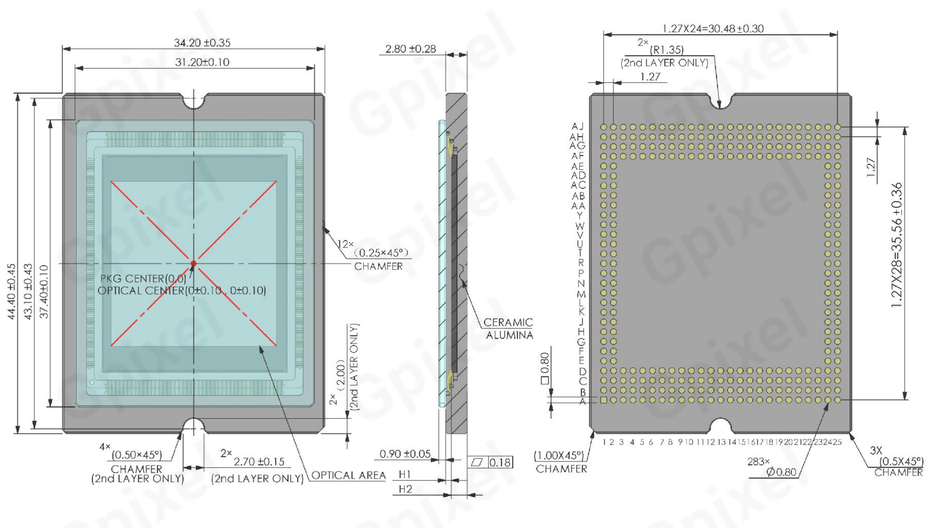
· Low noise
· Dual Gain HDR
· High sensitivity
· High frame rate

Application

· Life Sciences
· Microscopy

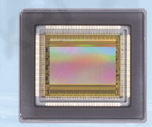
Specifications			
Nr of Active Pixels	3200 (H) x 3200(V)	**Pixel size**	6.5 μm x 6.5 μm
Optical format	1.83"	**Shutter type**	Rolling shutter
Photosensive area	20.8 mm x 20.8 mm	**Input clock rate**	960 MHz
Peak QE	95% Peak QE @ 610 nm	**Full well capacity**	21 ke^-
Dark Current	0.2 e^-/pixel/s @ -10°C	**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 2MP 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 max. frame rate is 83 fps in 12 bit rolling HDR mode. The sensor's HDR mode outputs two images after each exposure, which can be combined off-chip to achieve up to 87 dB dynamic range. The sensor also supports 653 fps in the high-speed mode with a trade-off on readout noise.

Key features and Benefits

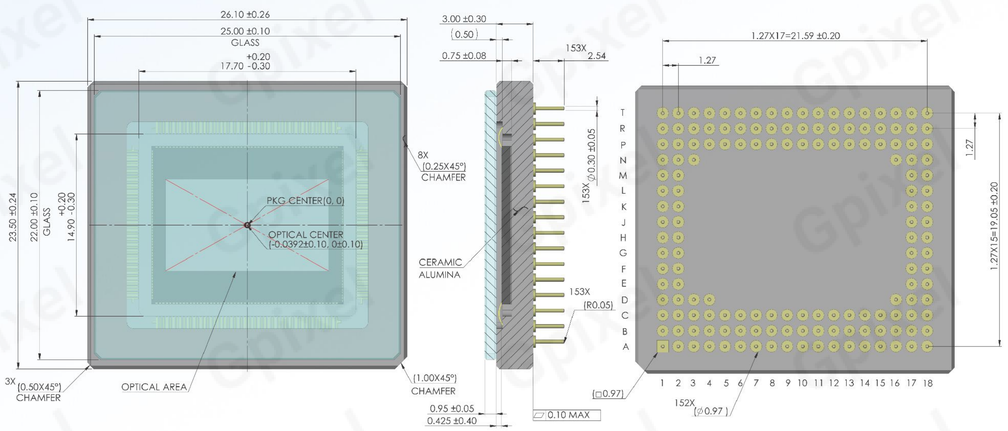
· Scientific CMOS
· Peak QE of 72%
· Low noise, low power for long exposure modes

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 an 81 MP backside illuminated scientific CMOS image sensor designed with large imaging area and an exceptional peak QE of 97%. The sensor provides active resolution of 8900(H) x 9120(V) with 10 μm x 10 μm pixel size. The inter-scene dynamic range is 84.5 dB, combined from maximum full well capacity of 90 ke^- and readout noise of 5.35 e^-. GSENSE1081BSI supports on-chip 16 bit ADC, with 5 LVDS channels running up to 250 MHz each, providing a maximum frame rate of 0.34 fps. GSENSE1081BSI is assembled in a SiC package with one flexi-cable, reducing the gap in tiling. The thermal expansion of SiC is close to silicon die which is suitable for deep cooling applications.

Key features and Benefits

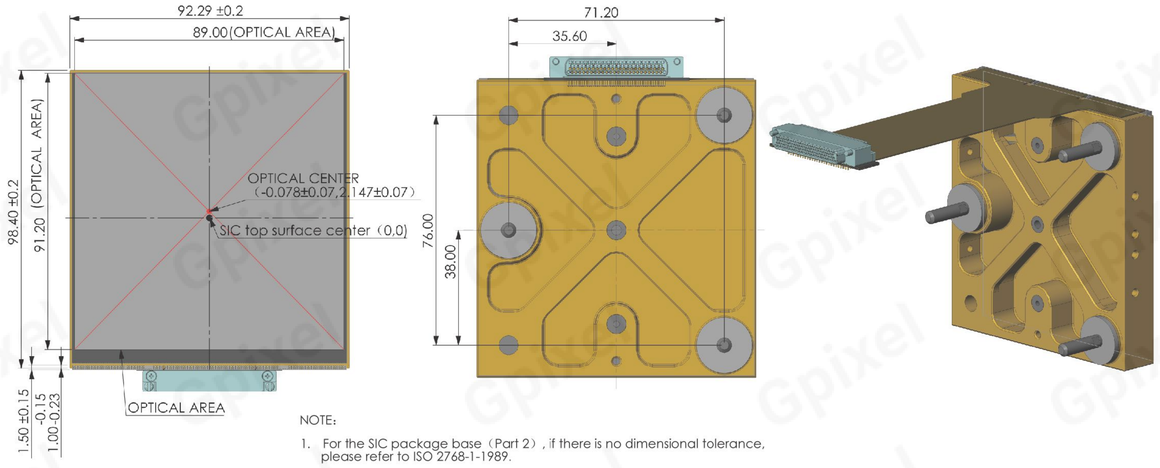
· 97% Peak QE @ 610 nm
· Anti-glowing
· On-chip 16-bit column-parallel ADC
· Silicon carbide with one flexi-cable

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

GLUX is a backside illuminated, scientific grade CMOS image sensor product family combining sub-electron noise performance, large pixel size, and high frame rates for ultra-low light imaging in scientific and surveillance applications. Products in this family are fully pin compatible and based on a 1" optical format.

GLUX9701BSI GLUX1605BSI

Product Family Features

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

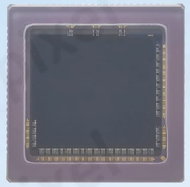
Applications

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



GLUX9701BSI

1.3MP BSI CMOS IMAGE SENSOR



GLUX9701BSI a 1" sized, high sensitivity BSI scientific CMOS image sensor with a resolution of 1.3MP (1280 x 1024) and large 9.76 µm x 9.76 µm pixels. The sensor supports a dual-gain HDR mode, achieving a dynamic range of 89.5 dB. A dedicated low noise mode further optimizes imaging performance with read noise of 0.85 e^- and power consumption of only 122 mW. The image can be output via either 4 channels sub-LVDS or 4 channels MIPI and the maximum frame rate is 30 fps. The sensor is pin compatible with GLUX1605BSI.

Key features and Benefits

- High sensitivity
- High dynamic range
- <1 e^- readout noise
- MIPI output option

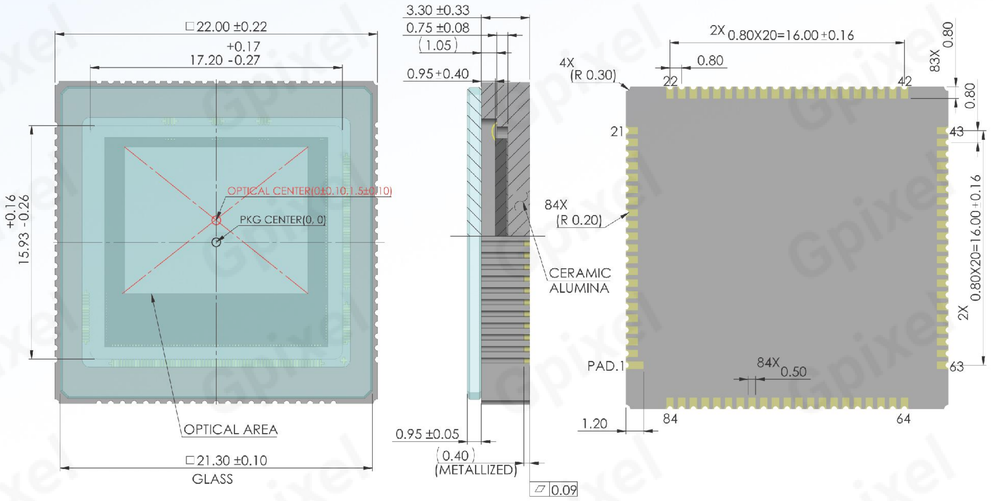
Application

Biosciences

Surveillance

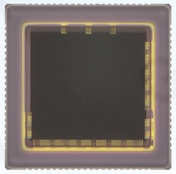
Specifications			
Nr of Active Pixels	1280 (H) x 1024 (V)	**Pixel size**	9.76 µm x 9.76 µm
Optical format	1"	**Shutter type**	Global shutter
Photosensive area	12.493 mm x 9.994 mm	**Full well capacity**	48 ke^-
Peak QE	89% @ 610 nm	**Temporal noise**	0.85 e^-
Max. SNR	46.8 dB	**Dark Current**	0.08 e^-/pixel/s @ -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 1" sized, high sensitivity BSI scientific CMOS image sensor with a resolution of 0.5 MP (800 x 600) and large 16 µm x 16 µm pixels. The sensor supports a dual-gain HDR mode, achieving a dynamic range of 93 dB. A dedicated low noise mode further optimizes imaging performance with read noise of 0.9 e^- and power consumption of only 83 mW. The image can be output via either 4 channels sub-LVDS or 4 channels MIPI and the maximum frame rate is 60 fps. The sensor is pin compatible with GLUX9701BSI.

Key features and Benefits

- High sensitivity
- High dynamic range
- <1 e^- readout noise
- MIPI output option

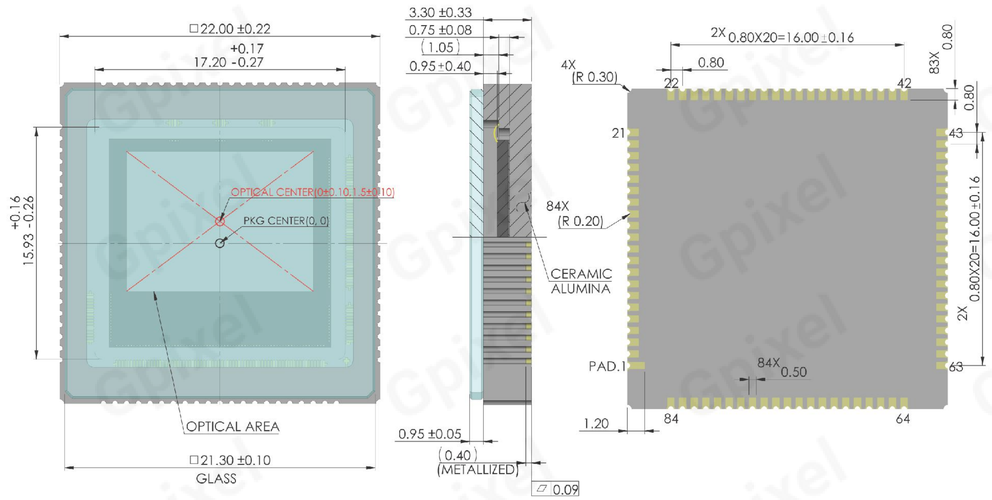
Application

Biosciences

Surveillance

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 a family of indirect time-of-flight (iToF) image sensors for 3D imaging, depth measurement, and ranging applications. This sensor family utilizes 3D wafer stacking at backside illumination technology to optimize sensitivity and precision.

GTOF0503

Product Family Features

- BSI stacked
- High measurement accuracy
- High sensitivity
- Dual frequency mode

Applications

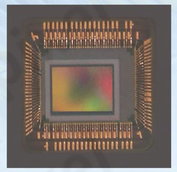
- Vision-guided Robots
- Industrial Automation
- Security monitoring
- Disorderly Grasping
- Logistics
- 3D measurement



Gpixel

GTOF0503

VGA ITOF CMOS IMAGE SENSOR



GTOF0503 is a VGA sensor featuring a 5 μm 3-tap state-of-the-art iTof pixel for high-precision depth measurement. 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. 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

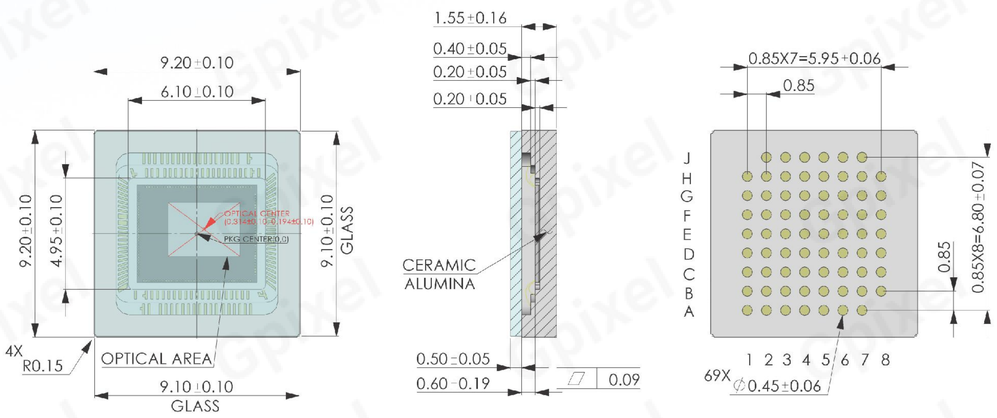
Application

- 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 family of image sensors for the professional imaging and broadcasting fields. The products utilize the latest stacked back-illuminated technology and feature high resolution, high frame rate, high sensitivity, and high dynamic range for broadcast, professional photography, drones, and high-end 8K video imaging.

GCINE3243 GCINE4349

Product Family Features

- Wafer stacking and backside illumination
- High frame rate
- High dynamic range
- Low noise

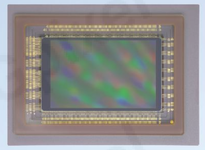
Applications

- Professional imaging



GCINE3243

8K APS-sized CMOS Image Sensor



GCINE3243 is a 43MP 26.2 mm x 16.7 mm sized APS-style image sensor with a 3.2 µm 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. Readout 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 readout noise and offering global reset shutter control. Additional HDR features, like dual gain readout, on-chip digital compression and multi-slope pixel response are also available.

Key features and Benefits

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

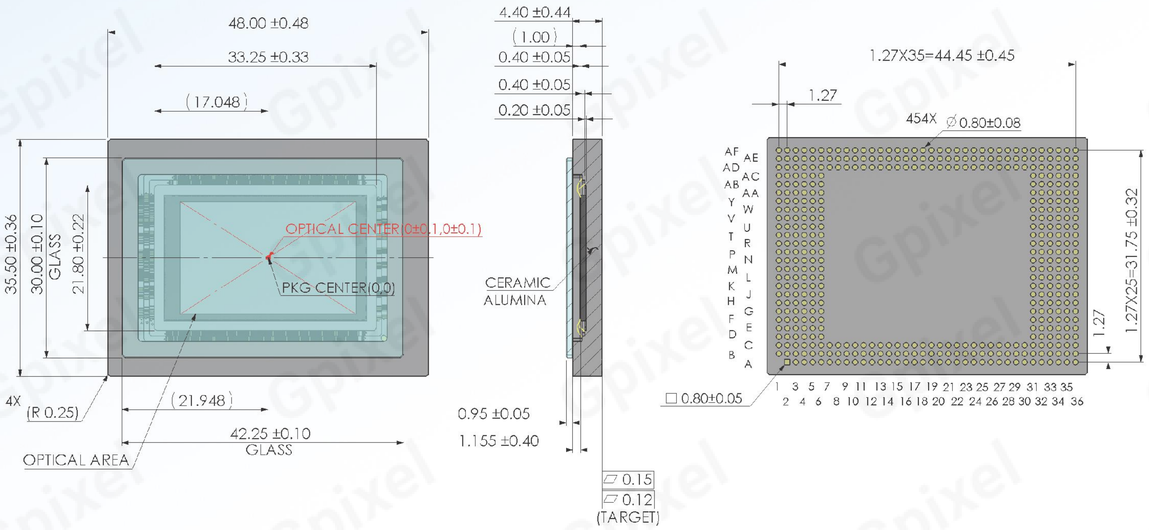
Application

- Cinematography
- Unmanned Aerial Vehicles (UAV)

Specifications

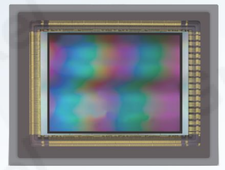
Nr of Active Pixels	8192 (H) x 5232(V)	**Pixel size**	3.2 µm x 3.2 µm
Optical format	APS-C	**Shutter type**	Rolling Shutter & DSC
Photosensive area	26.2 mm x 16.7 mm	**Full well capacity**	96 ke⁻ @ Multi-exposure Mode
Peak QE	80% @ 550 nm (Mono)	**Temporal noise**	2.5 e⁻ @ DSC High Gain Mode
Max. SNR	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 mm 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 readout 8K video at 120 fps or binned 4K video at 240 fps, with a pixel bit depth of up to 16 bit/pixel interfaced over 64 sub-LVDS channels @ 1.2 Gbps/channel. A dedicated Digital Still Camera (DSC) mode is supported, improving the readout noise and offering global reset shutter control. Additional HDR features, like dual gain readout, on-chip digital compression and multi-slope pixel response are also available.

Key features and Benefits

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

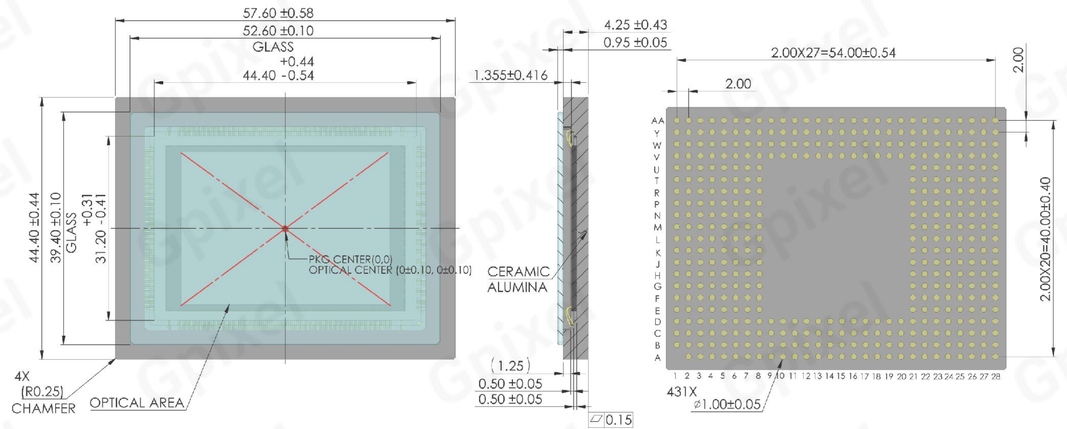
Application

- 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**	152 ke⁻
Peak QE	85%	**Temporal noise**	1.9 e⁻
Max. SNR	52 dB	**ADC**	16 bit
Max Frame rate	120 fps @ 8K,240fps @ 4K	**Dynamic Range**	86.4 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	4.5 W-7.6 W	**Package**	431 pins LGA (57.6 mm x 44.4 mm)

Package Drawing



Gpixel

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

Line Scan CMOS Image Sensor

This sensor family comprises GL line scan image sensors with horizontal resolutions ranging from 2k to 16k, GLT sensors utilizing true charge-domain time delay and integration (TDI), and GLR sensors with rectangular pixels for displacement meters and spectroscopic imaging.

GLR1205BSI-S
GL0402
GLT5009BSI
GL1402
GL7004
GL7008
GL3504
GL0816
GL3516

Product Family Features

- Global shutter
- TDI
- High line frequency
- Multispectral

Applications

- Lithium Battery Inspection
- Printing Inspection
- Track Inspection
- PCB Testing
- Screen Inspection
- Automatic Sorting
- Semiconductor Testing
- Displacement Metering

GLR1205BSI-S

250 μm LINE SCAN CMOS IMAGE SENSOR



GLR1205BSI-S is a single-line linear image sensor with rectangular pixels and analog output designed for use in displacement sensors.The sensor's 512 pixels are each 12.5 μm (H) x 250 μm (V) and provide a full well capacity of 2.8 million electrons and a maximum signal-to-noise ratio of 71.1 dB. The large pixel also increases the photosensitive area and facilitates easy alignment of the laser spot. Backside thinning technology enables a peak quantum efficiency of 95%, and almost 50% at 650 nm. A charge transfer time of only 2.5 μs ensures excellent lag performance. The single analog output allows image processing using an MCU module, and the small CSP package enables the design of a compact displacement sensor.

Key features and Benefits

- BSI linear sensor
- Rectangular pixel
- High sensitivity
- CSP package
- Large FWC

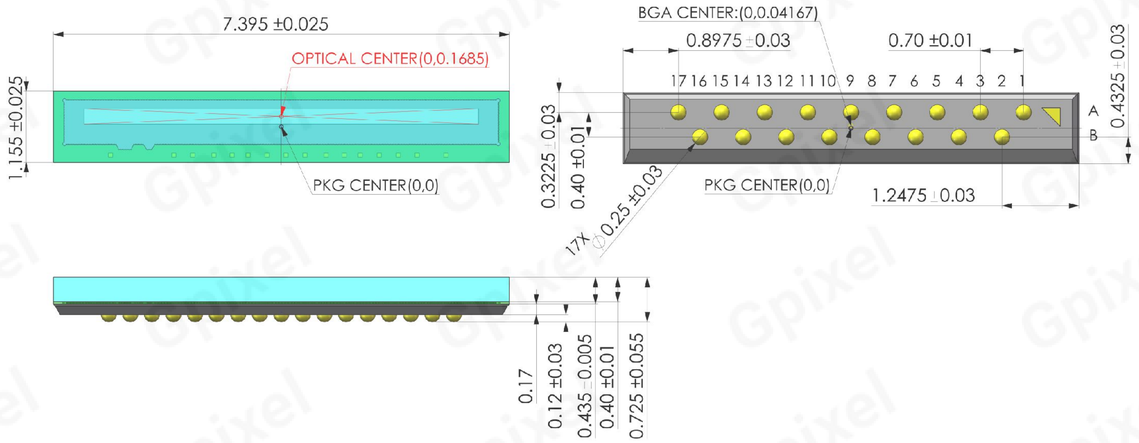
Application

- Automation & Inspection
- Logistic & Positioning

Specifications

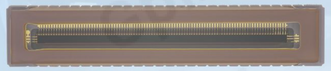
Nr of Active Pixels	512 (H) x 1 (V)	**Pixel size**	12.5 μm x 250 μm
Optical format	0.4"	**Shutter type**	Global shutter
Saturation output voltage	2.1 V	**Photosensitive area**	6.4 mm x 0.25 mm
Peak QE	95%	**Temporal noise**	0.58 mV rms
Max Line rate	9.43 kHz	**Dynamic Range**	3620:1
Output format	Analog output	**Chroma**	Mono
Max. Data rate	5 MHz	**Supply voltage**	3.3 V
Power consumption	90 mW	**Package**	17-pin CSP (7.395 mm x 1.155 mm)

Package Drawing



GL1402

2K LINE SCAN CMOS IMAGE SENSOR



GL1402 is a 2k line scan image sensor with 14 μm pixels. The color version of the sensor features red, green, and blue rows with 14 μm gaps between each row to minimize color crosstalk. The monochrome sensor features a three row monochrome option with a readout 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 readout 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

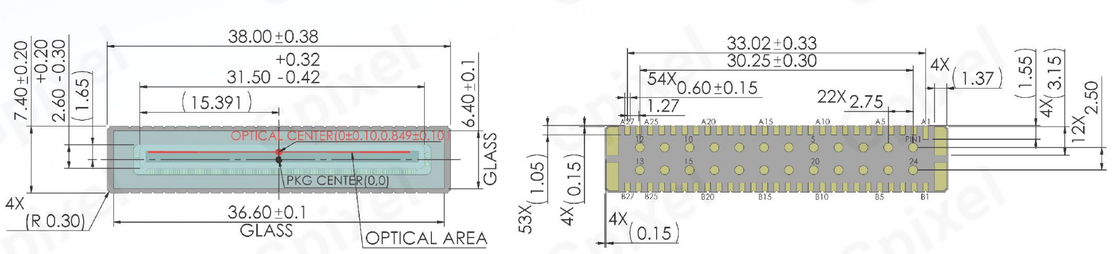
Application

- Grain Sorting
- Tomography (OCT)

Specifications

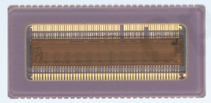
Nr of Active Pixels	2048 (H) x 1 (V), 2048 (H) x 3 (V)	**Pixel size**	14 μm x 14 μm
Optical format	28.896 mm	**Shutter type**	Global shutter
Full well capacity	28.7 ke$^-$	**Photosensive area**	28.896 mm
Peak QE	69.3% @ 560nm	**Temporal noise**	9.1 e$^-$
Max. SNR	44.5 dB	**Dark Current**	702.7 e$^-$/pixel/s @ 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 pixels and four lines with 7 μm pixels. GL3504 can 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 readout. GL3504 is assembled with a compact 58-pin CLCC package for fast heat dissipation and high robustness. Both monochrome and color variants are offered.

Key features and Benefits

- High Speed
- Low Consumption
- High Dynamic Range
- C Mount Compatible

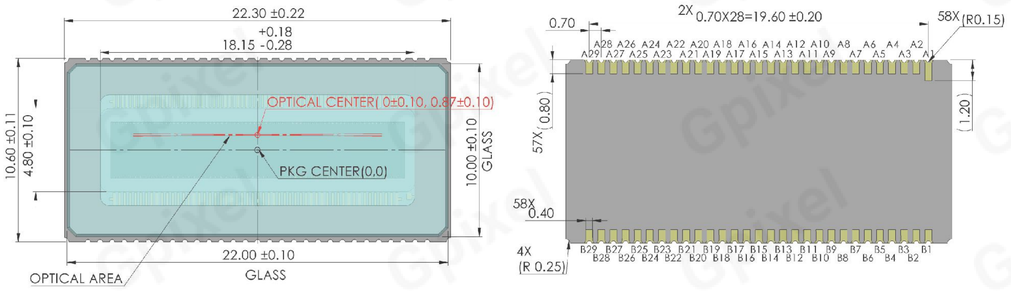
Application

- Automation & Inspection

Specifications

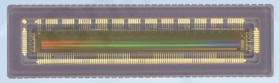
Nr of Active Pixels	4096 (H) x 2 (V) @ 3.5 μm / 2048 (H) x 4 (V) @ 7 μm	**Pixel size**	3.5 μm x 3.5 μm / 7 μm x 7 μm
Optical format	14.336 mm	**Shutter type**	Global shutter
Full well capacity	9.3 ke$^-$	**Photosensive area**	14.336 mm
Peak QE	7 μm: 71.9% @ 570 nm,3.5 μm: 62.0% @ 620 nm	**Temporal noise**	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 a maximum 200 kHz line rate in single line mode and 100 kHz line rate in dual line mode. GL0402 offers read noise of less than 5.2 e^- and 10 ke^- FWC for 65.6 dB intra-scene dynamic range. GL0402 uses external clock and all required timing is generated by the on chip sequencer, reducing the amount of external components needed. Output channel multiplexing enables flexibility in FPGA choice, suitable for cost-effective camera solutions for demanding inspection applications. GL0402 is assembled in a compact 76-pin CLCC package for fast heat dissipation and high robustness.

Key features and Benefits

· High Speed
· Low Noise
· High Dynamic Range

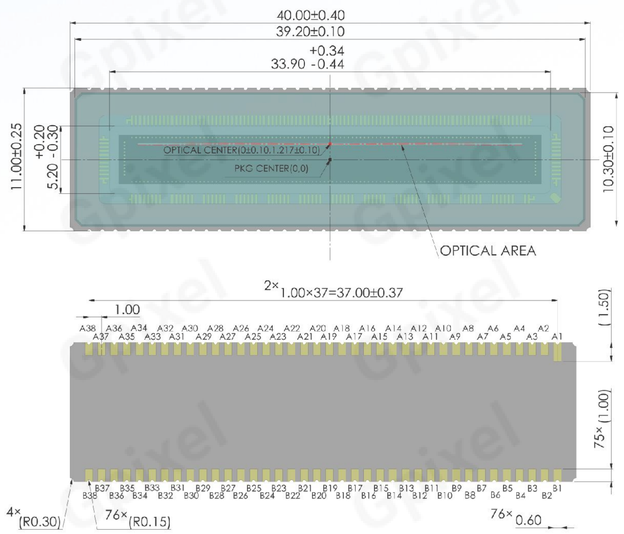
Application

· Automation & Inspection

Specifications

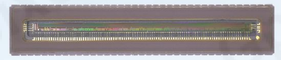
Nr of Active Pixels	4096 (H) x 2 (V)	**Pixel size**	7 μm x 7 μm
Optical format	28.67 mm	**Shutter type**	Global shutter
Full well capacity	25 ke^- @ low gain,10 ke^- @ high gain	**Photosensive area**	28.67 mm
Peak QE	75.57% @ 570 nm	**Temporal noise**	5.2 e^-
Max. SNR	43.9 dB	**Dark Current**	10 ke^-/pixel/s @ 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 industrial inspection applications including sorting, solar panel inspection, printing inspection and railway monitoring at a cost-effective price point. The GL7004 is available in a compact LCC ceramic package, requiring only 3 external power supplies and consuming only 1.05 W.

Key features and Benefits

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

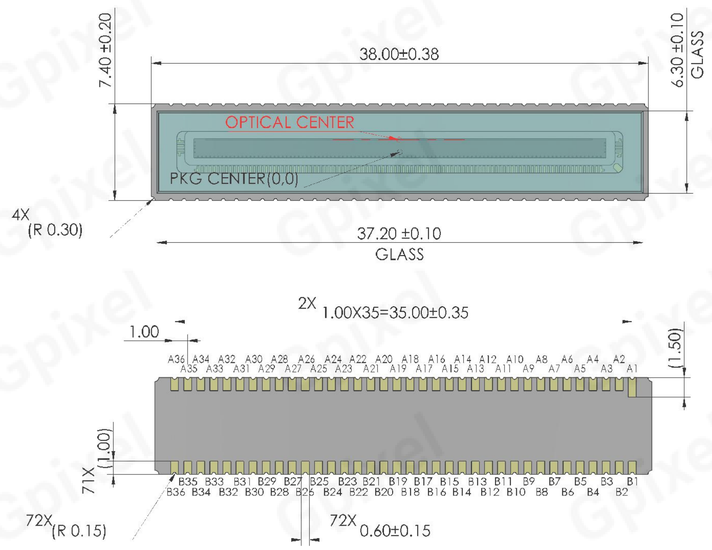
Application

· Automation & Inspection
· Logistic & Positioning

Specifications

Nr of Active Pixels	4096 (H) x 4 (V)	**Pixel size**	7 μm x 7 μm
Optical format	28.67 mm	**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 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 spacing. 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. The color verion of GL0816 is manufactured with RGBW 4-band CFA with extremely low color crosstalk to enable accurate image reproduction.

Key features and Benefits

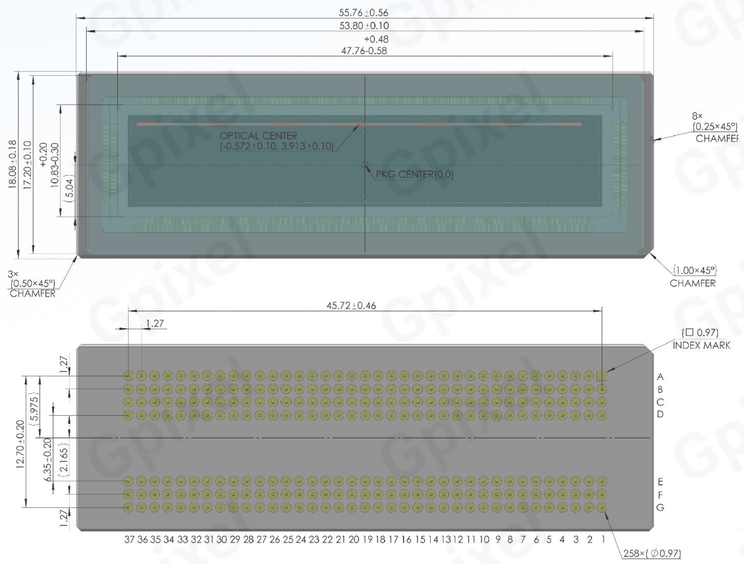
- High Speed
- TDI
- Excellent Color Accuracy
- High Resolution

Application

- Automation & Inspection

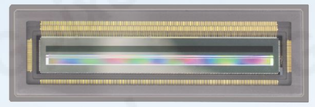
Specifications			
Nr of Active Pixels	8322 (H) x 16 (V)	**Pixel size**	5 μm x 5 μm
Optical format	41.61 mm	**Shutter type**	Global shutter
Full well capacity	17 ke⁻@ 11 bit, dual line; 15 ke⁻ @ 10 bit, quad line	**Photosensive area**	41.61 mm
Peak QE	>70% @ 600 nm	**Temporal noise**	13 e⁻ @ 11 bit, dual 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), charge-domain Time delay and integration (TDI) CMOS image sensor with 5 μm pixels, 9k resolution and line rate up to 608 kHz. 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 scan direction. GLT5009BSI is assembled in a 269-pin μPGA package for reliability and good heat dissipation.

Key features and Benefits

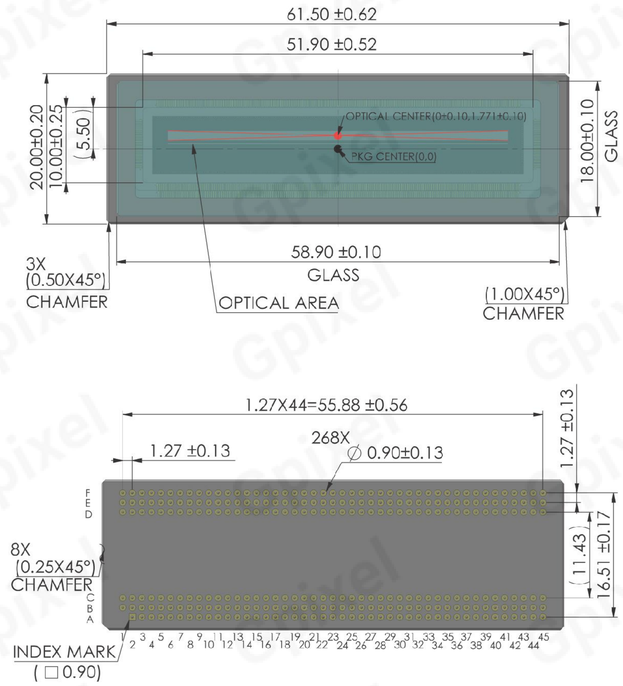
- True charge-domain TDI
- High Speed
- Back Side Illuminated (BSI)
- HDR read out
- High Sensitivity
- QE @ 266nm≥50%

Application

- Automation & Inspection
- Life Sciences
- Microscopy
- Semiconductor Inspection

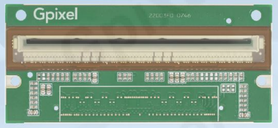
Specifications			
Nr of Active Pixels	9072 (H) x (256 + 32) (V)	**Pixel size**	5 μm x 5 μm
Optical format	45.36 mm	**Shutter type**	Global shutter
Full well capacity	15.8 ke⁻ @ 10 bit / 15.9 ke⁻ @ 12 bit	**Photosensive area**	P1: 45.36 mm × 1.28 mm, P2: 45.36 mm × 0.16 mm
Peak QE	STD : 82.4% @ 550 nm / DUV : 61% @ 248 nm	**Temporal noise**	10.5 e⁻ @ 10 bit ,6.2 e⁻ @ 12 bit
Max. SNR	42 dB	**Dark Current**	~8 ke⁻/pix/sec @ 30°C
Max Line rate	608 kHz @ 10 bit / 300 kHz @ 12 bit	**Dynamic Range**	63.5 dB @ 10 bit,68.1 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 @12bit, <8.2 W @10bit	**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 resolution. 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 and is pin compatible with GL3516.

Key features and Benefits

· Individual exposure control for each color line
· Easy Integration
· External Trigger
· Pin Compatible with GL3516

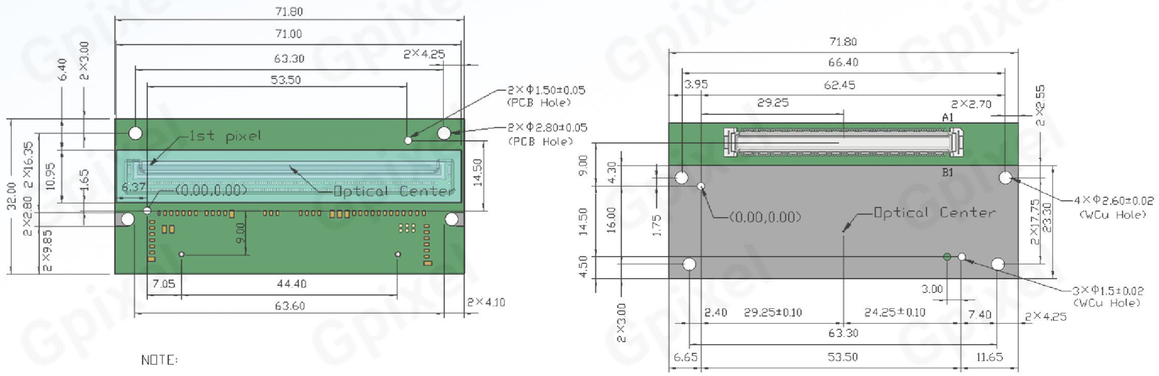
Application

· 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

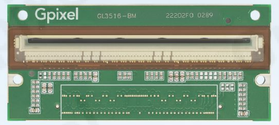


NOTE:

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 a 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. GL3516 is offered in both color and monochrome versions. The monochrome sensor supports single and dual line modes. The color sensor supports dual line mode. GL3516 is assembled in a COB package with WCu heat sink for optimal heat dissipation and with connector for easy integration. GL3516 is an ideal solution for the inspection of lithium batteries, flat panel displays, PCBs, labels, and railways.

Key features and Benefits

· High Resolution
· Easy Integration
· Pin Compatible with GL7008

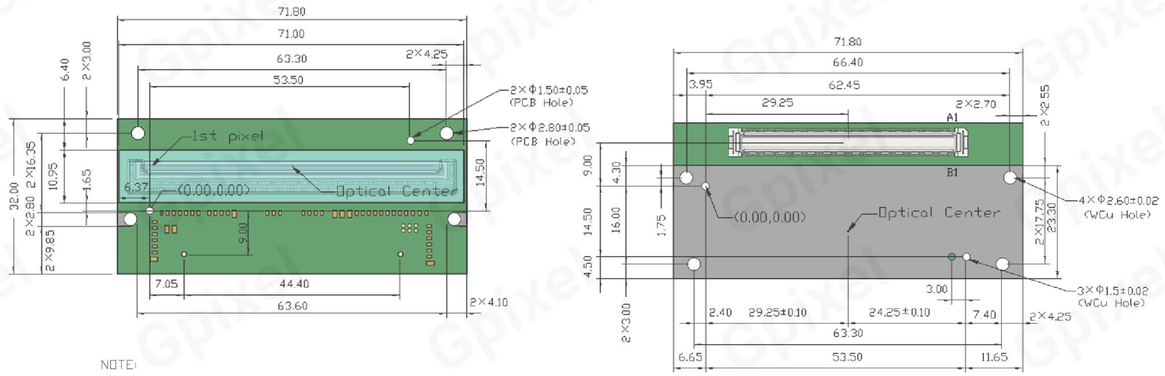
Application

· Automation & Inspection

Specifications

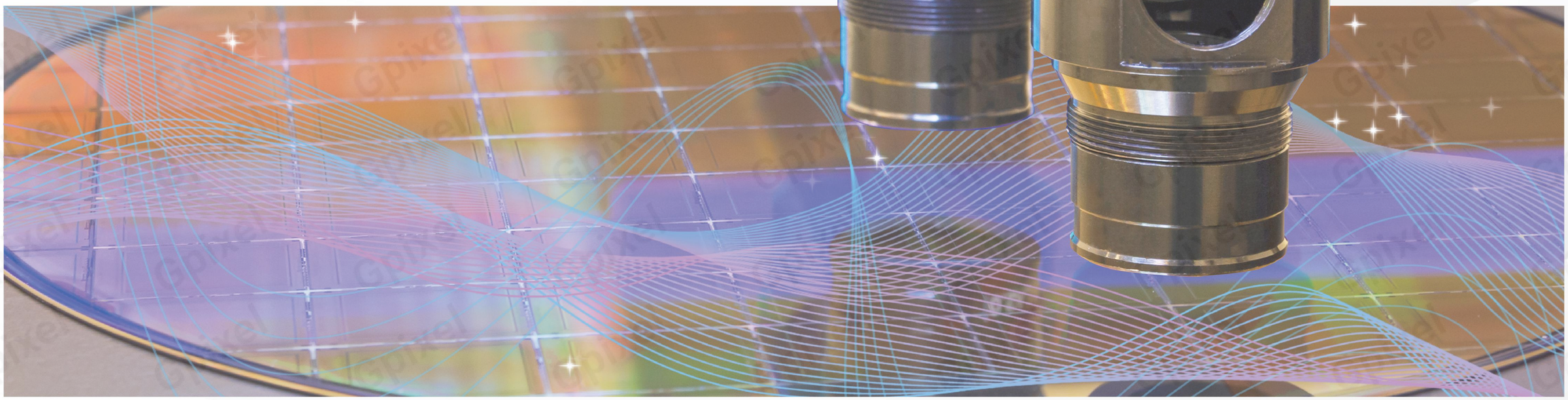
Nr of Active Pixels	16384 (H) x 2 (V)	**Pixel size**	3.5 μm x 3.5 μm
Optical format	57.344 mm	**Shutter type**	Global shutter
Full well capacity	5.6 ke⁻	**Photosensive area**	57.344 mm
Peak QE	57.1% @ 530 nm	**Temporal noise**	8.2 e⁻
Max. SNR	37.4 dB	**Dark Current**	0.8 ke⁻/pixel/s @ 42°C
Max Line rate	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