# GSENSE1517BSI

16.8MP SCIENTIFIC CMOS IMAGE SENSOR

GSENSE1517BSI is a 4116 x 4100 (16.8 MP) resolution scientific image sensor with high-performance 15 x 15 μm^2 pixels, a large 61.74 x 61.50 mm imaging area, peak QE of 92% and minimum read noise 1.2 e$^-$. **GSENSE1517BSI** fills a gap in available high-performance scientific image sensors by offering a new, larger pixel size in the popular 60 mm square format. Applications for this image sensor include astronomy imaging tasks like space situational awareness (SSA), orbital object tracking, other space-related imaging, and physical sciences research.

The sensor utilizes dual-gain HDR and both 12-bit and 14-bit ADCs to achieve a variety of imaging modes. Both 12-bit HDR and 14-bit STD are supported at up to 4 fps utilizing 10 pairs of LVDS working at 420 Mbps each. In 12-bit dual-gain HDR mode, an intra-scene dynamic range over 95.3 dB is achieved with 70 ke- full well capacity and 1.2 e$^-$ readout noise. In 14-bit STD mode, either the LG or HG signal can be utilized. Using the HG signal, read noise is 1.5 e$^-$ and a dynamic range of 79.6 dB is achieved. Using the LG signal, the maximum full well capacity of 70 ke$^-$ provides an SNR up to 265.

GSENSE1517BSI is assembled in a high-end SiC package designed such that the dead space at 3x package sides is minimized for mosaic tiling.

The thermal expansion of SiC is close to that of the silicon die, providing mechanical stability over the sensor's full operating range from -60 ℃ to 50 ℃. The sensor's 144-pin Al_2O_3 IPGA ceramic package is offered with removable cover glass for easy assembly into cooled camera systems.
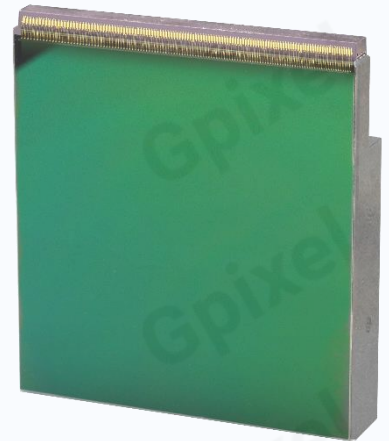
Key Features

- 61 mm sq. large format sensor with frame rate up to 4 fps
- 92% Peak QE @ 450nm
- Low noise of 1.2 e-
- Dynamic Range of 79.6 dB extended to 95.3 dB with dual gain HDR
- Anti-glowing design architecture
- Low dark current: 0.0069 e$^-$/s/pix @ -60℃
- On-chip 12-bit and 14-bit column-parallel ADC
- 3-side buttable with SiC package

Applications

- Astronomy Imaging
- Space Situational Awareness (SSA)
- Physical Sciences Research.

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Sensor Specifications

Resolution	4116(H) × 4110(V)	Photo-sensitive area	61.74 mm x 61.50 mm
Pixel size	15 μm × 15 μm	Operation temperature	-60 ℃ ~ 50 ℃
Shutter type	Rolling Shutter	Quantum efficiency	92% @ 450 nm
Full well capacity	70 ke⁻ @ 12-bit HDR & 14-bit LG 14.4 ke⁻ @ 14-bit HG	Data rate	420 MHz
Temporal noise	1.2 e⁻ @ 12-bit HDR 10.9 e⁻ @ 14-bit LG 1.5 e⁻ @ 14-bit HG	Dark current	0.0069 e⁻/s/pix @ -60 ℃
Dynamic range	95.3 dB @ 12-bit HDR 76.1dB @ 14-bit LG 79.6 dB @ 14-bit HG	Frame rate	4 fps @ 12-bit HDR & 14-bit
Data Output interface	LVDS	Max. Data rate	4.2 Gbps
Chroma	Mono	Power consumption	< 1 W
Supply voltage	Analog 3.3 V Digital 1.55 V IO 1.8 V	Package	SiC with 144-pin Al_2O_3 IPGA ceramic package

Ordering Information

Sensor Part No.

GSENSE1517BSI-ABM-NFN-NND	BSI Image Sensor, monochrome without microlens on die. Silicon carbide with 144-pin Al_2O_3 IPGA ceramic package Without glass lid. Demo Grade
GSENSE1517BSI-ABM-NFN-NNE	BSI Image Sensor, monochrome without microlens on die. Silicon carbide with 144-pin Al_2O_3 IPGA ceramic package Without glass lid. Engineering sample

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