



GSENSE1517BSI

16.8 MP SCIENTIFIC CMOS IMAGE SENSOR

GSENSE1517BSI is a 4116 x 4100 (16.8 MP) resolution scientific image sensor with high-performance 15 μm x 15 μm pixels, a large 61.74 mm x 61.50 mm imaging area, peak QE of 92% and minimum read noise 1.2 e^- . The sensor utilizes 12 bit dual-gain HDR, and both 12 bit and 14 bit single gain and 16 bit single gain 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. For 16 bit STD mode, only 3 pairs of LVDS is utilized. 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^- . In 16 bit STD mode, with the maximum full well capacity of 70 ke^- and the readout noise of 5.8 e^- , it can achieve a dynamic range of 81.5dB.

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. The sensor's 144 pins Al_2O_3 IPGA ceramic package is offered with removable cover glass for easy assembly into cooled



Key Features and Benefits

- ▶ 61 mm sq. large format sensor with frame rate up to 4 fps
- ▶ 92% Peak QE (450 nm)
- ▶ Low noise of 1.2 e^-
- ▶ Anti-glowing design architecture
- ▶ Low dark current: < 0.008 e^- /pixel/s(-70°C)
- ▶ On-chip 16 bit column-parallel ADC
- ▶ 3-side buttable with SiC package

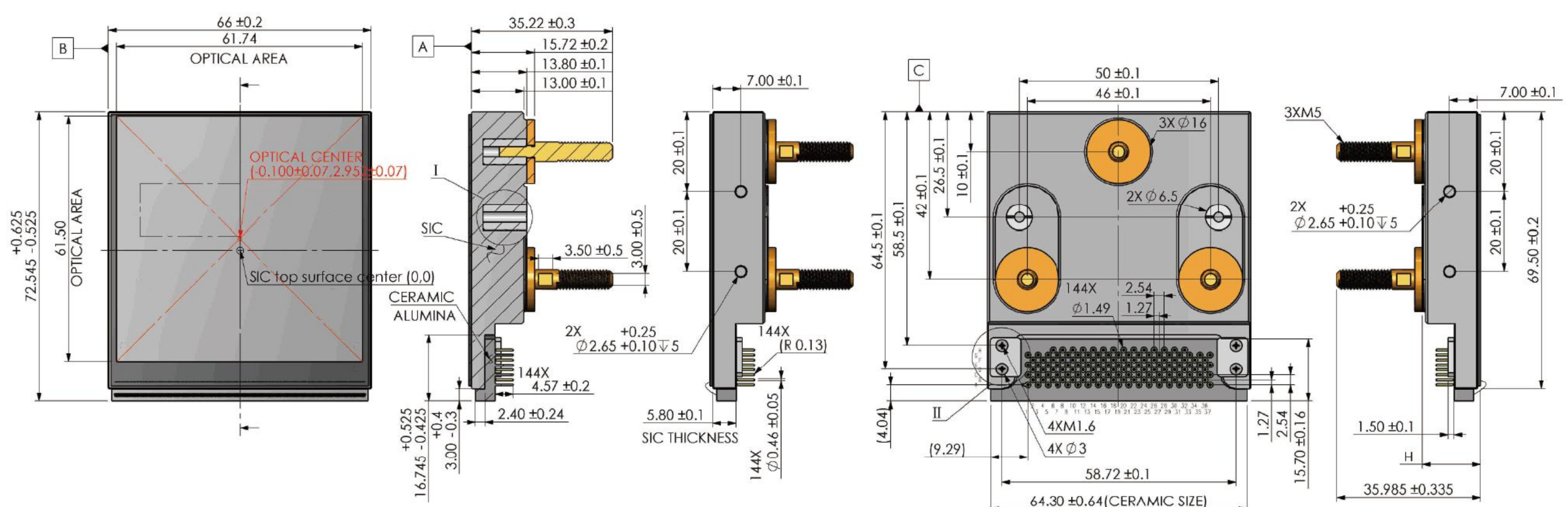
Application

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

Specifications

Nr of Active Pixels	4116 (H) x 4100(V)	Photosensitive Area	61.74 mm x 61.50 mm
Pixel Size	15 μm x 15 μm	Dark Current	< 0.008 e ⁻ /pixel/s (-70 °C)
Shutter Type	Rolling Shutter	Peak QE	92% (450 nm)
Full Well Capacity	70 ke ⁻ (12 bit, HDR & 14 bit LG) 14.4 ke ⁻ (14 bit, HG)	Temporal Noise	1.2 e ⁻ (12 bit HDR) 10.9 e ⁻ (14 bit LG) 1.5 e ⁻ (14 bit HG) 5.8 e ⁻ (16 bit LG)
ADC	16 bit	Dynamic Range	95.3 dB(12 bit HDR) 76.1 dB(14 bit LG) 79.6 dB(14 bit HG) 81.5 dB(16 bit LG)
Frame Rate	4 fps (12 bit HDR & 14 bit) 1.1 fps (16 bit)	Output Format	10 Pairs of LVDS
Max. Data Rate	4.2 Gbps	Power Consumption	< 1 W
Chroma	Mono	Operation Temperature	-70 °C ~ 50 °C
Supply Voltage	3.3 V (Analog) 1.55 V (Digital) 1.8 V (IO)	Package	SiC with 144 pins Al ₂ O ₃ IPGA ceramic package

Package Drawing



Contact Gpixel

GPiXEL CHINA CHANGCHUN (HQ)

Building 5, Optoelectronic Information
Industrial Park, 7691 Ziyou Road,
130033 Changchun, Jilin, China
Phone: +86-431-85077785

GPiXEL EUROPE

Gpixel NV
Copernicuslaan 60, 2018
Antwerpen, Belgium
Phone: +32-33034442

GPiXEL JAPAN

Gpixel Japan Co., Ltd.
TOC Osaki Building 18th Floor, 1-6-1 Osaki,
Shinagawa-ku, Tokyo, 141-0032 Japan
Phone: +81-03-5962-1600



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