OXYGEN® RD0092

Dual-Band, Dual-Polarity
8 µm Pitch, 1280 x 720 DROIC

The Oxygen® RD0092 is an advanced off-the-shelf DROIC with cutting-edge performance that can be used with any industry-standard direct-injection compatible detector technology. The solution was designed to optimize FPA performance through state-of-the-art integrated features and multiple operating modes that offer flexibility for a wide range of high-performance application requirements.

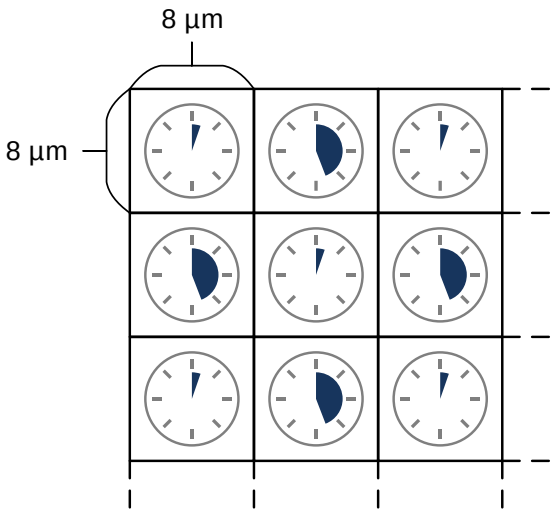
Features

- 8 µm dual-gain pixels with 260 ke- or 3.4 Me- capacity
- Low power direct injection detector bias for both polarities
- Dual-band (2-color) or single-band operation
- Integrate-while-read and integrate-then-read operation
- Asynchronous or synchronous global shutter (snapshot)
- High dynamic range (>120dB)
- 14-bit column-parallel conversion
- Over 500 fps at full frame, serialized to 16-bits/pixel
- Unlimited 32 x 32 windows at 8,895 fps per window
- Selectable 2, 4, 8 or 16 LVDS output ports
- SPI control interface (SenSPI®) and DDR master clock

High Dynamic Range Dual-Integration Capability

The Oxygen RD0092 can run two different integration times simultaneously on a checkerboard pattern of pixels across the array. This mode leverages the small 8 µm pitch focal plane sampling to achieve high dynamic range without loss of event data for infrared systems with typical Airy disk diameters.

The diagram below illustrates a segment of an array of 8 µm pixels with a graphic representation of the pixel well capacity. Each adjacent pixel has accumulated a different level of charge by operating in the High Dynamic Range Dual Integration mode.



Advanced Operating Modes

Readout Oversampling

The high-speed readout engine may be used to achieve superior low-noise performance through readout oversampling. Each row is oversampled by a programmable number of samples and the uncorrelated read noise will improve by the square root of the oversamples.

Sample-up-the-Ramp

For very low signal, stable scenes and long integration time, the DROIC can perform multiple readouts without resetting the pixel array. This performs a sample-up-the-ramp operation and provides another method to improve signal-to-noise ratios.

Choice of Frame and Integration Control

There are a wide range of control features including free-run mode, command word trigger or external asynchronous integration and readout clock. In the asynchronous case, the start and stop of integration time are completely asynchronous with only a propagation delay between clock input and pixel operation.

External Correlated Doubling-Sampling

High-gain mode utilizes correlated double-sampling (CDS) to remove the reset noise from the small integration capacitors. The DROIC provides sequential reset and signal frames for external CDS at the flip of a bit.

Multiple High-Speed Windows

The integrated signal may be held over multiple readout frames, enabling multiple windows per frame. Coupled with the high-speed readout engine, this allows very high -speed interrogation and tracking of objects and events.

Availability and Contact Information

Part number: RD0092-D080-WS
Available unit: full wafer
Available to order now
Contact sales for pricing information:
products@senseeker.com

Applications

Surveillance / Reconnaissance

High Dynamic Range Dual Integration mode runs two integration patterns simultaneously on a checkerboard pattern of pixels for optimal threat detection. Enhanced SNR using External Correlated Double-Sampling and multiple oversampling methods.

Infrared Search and Track

Global shutter (snapshot) mode with unlimited small windows is ideal for multi-object tracking. Dual-band 2-color support.

Range-Gated Imaging

Supports Time-of-Flight (TOF) through asynchronous integration with only a propagation delay between clock input and pixel operation. Global shutter operation and > 36,000 fps possible for small windows.

Infrared Astronomy

Sample-up-the-ramp mode for very low signal stable scenes and long integration times. Multiple readouts are possible without resetting the pixel array. Optimization of SNR through multiple oversampling methods.