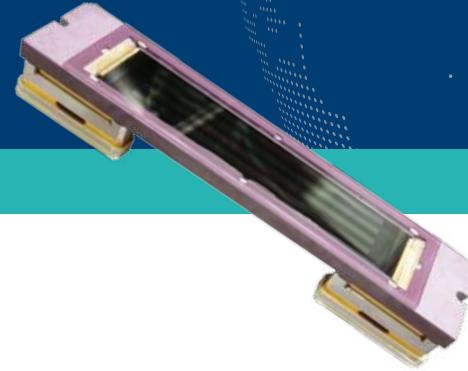




RD2600X4MS

Multispectral VIS-NIR CMOS bi-directional digital output line scanning detector with 4 independent lines of 2600 pixels and up to 64 TDI levels per line

Space



General Description

RD2600X4MS is a state-of-the-art Backside Illuminated (BSI) all CMOS VIS-NIR multi-array bi-directional line scanning detector. The detector is made of a single Silicon die with 4 independent lines, each with 2600 pixels. Pixel design is based on state of the art high gain, low noise, 4T CMOS technology providing very high sensitivity. The signal to noise ratio is improved by Time-Delay-Integration (TDI) per pixel with controllable depth of up to 64 levels. A built-in 2-phase scanning mechanism improves the dynamic MTF by reducing the scanning motion blur. An Electronic Shutter accurately controls the exposure time per each line, enabling optimized exposure as well as additional dynamic MTF improvement.

The Silicon die is housed in a sealed ceramic package providing very accurate mechanical interfaces and excellent heat transfer. The ceramic package is sealed with a glass window positioned in adjacent to the

photo-sensitive focal plane array. The glass window can support custom optical filters where each line is exposed to different spectral band (total of 4 bands).

The electrical signal collected from the pixels is converted into 12-bit digital signal using on-chip analog-to-digital converters. The digital image output simplifies the system design and enables image transmission with no additional noise. On board voltage regulators simplifies the power supplies requirements. The electrical interface to the system is through high reliability, easy to use, connectors. All of these together with additional built-in features simplify the electrical interface.

The detector power consumption is very low, its weight and size are minimized, and thus enables a very compact system solution. The CMOS die is RAD-Hard by design. Along with other aspects it makes this detector compatible for space applications.





Applications

- Earth observation (from space)
- Industrial process control
- Scientific and low light imaging

Main Features

- High sensitivity: Low readout noise, Low dark current, Backside Illuminated High Quantum Efficiency
- High image quality and High MTF
- Rad-Hard by design
- High line rate: up to 10,000 lines per second (bi-directional)
- Digital video output
- Simple mechanical and electrical interfaces

Typical Performance

| Parameter | Value |
|-------------------|--|
| Detector type | CMOS TDI line scanner |
| Spectral bands | 4, customer selectable bands in VIS-NIR |
| Format | 4 independent lines, 2600 pixels each |
| Pitch | 26µm |
| TDI depth | 8 to 64 (in steps of 8) |
| Pixel capacity | 300Ke- nominal (variable by comm.) |
| Floor noise | <120e- for all 64 TDI levels |
| Dynamic range | 71dB |
| Linearity | <2% (2% up to 95% of full well capacity) |
| Maximum line rate | 7,500 line/sec (10,000 line/sec design goal) |
| Power dissipation | <1.8W (at maximal line rate) |
| Video output | Digital, 12bit |
| Communication | Serial port |
| Clocks | Main: single LVDS up to 58MHz, line sync |
| Readout direction | Bi-directional |
| Environment | Radiation hardened for Space applications |