TELEDYNE IMAGING
Everywhereyoulook™

Orbis[51]
IC-51-12K2B-00-R (BSI) / IC-51-12K2F-00-R (FSI)
Imaging Sensors

Key Features

» Very high resolution
» CCD on CMOS architecture
» 6 Multispectral Bands (B1-B6) and 2 Panchromatic bands (P1 and P2, with half pixel offset)
» Selectable TDI stages: B1-B6: 2, 4, 8, 16, 24, 32, 48, 64 P: 4, 8, 16, 32, 48, 64, 96, 128
» User selectable outputs: 16 or 8 with line rate impact
» Back thinned – back illuminated technology
» Front side illumination options
» Integrated multispectral filters
» On-chip integration / easy to integrate
» Anti-blooming
» Bi-directional
» Fully digital outputs – no focal plane ADCs required
» Radiation tolerance:
  • ≥ 20 krad (Si), Co^{60} (TID)
  • No destructive latch-up (SEL) ≥ 75 MeV/mg/cm^2

Typical Applications

» Earth observation
» Remote sensing
» Aerial reconnaissance

Options suited to New Space applications available upon request.

Teledyne Imaging has extensive heritage in providing standard and customised image sensors for space applications. Please discuss any requirements for customised variants to meet your needs.

12k Pixel Bidirectional, Multispectral Charge Domain TDI CMOS Sensor with Filters

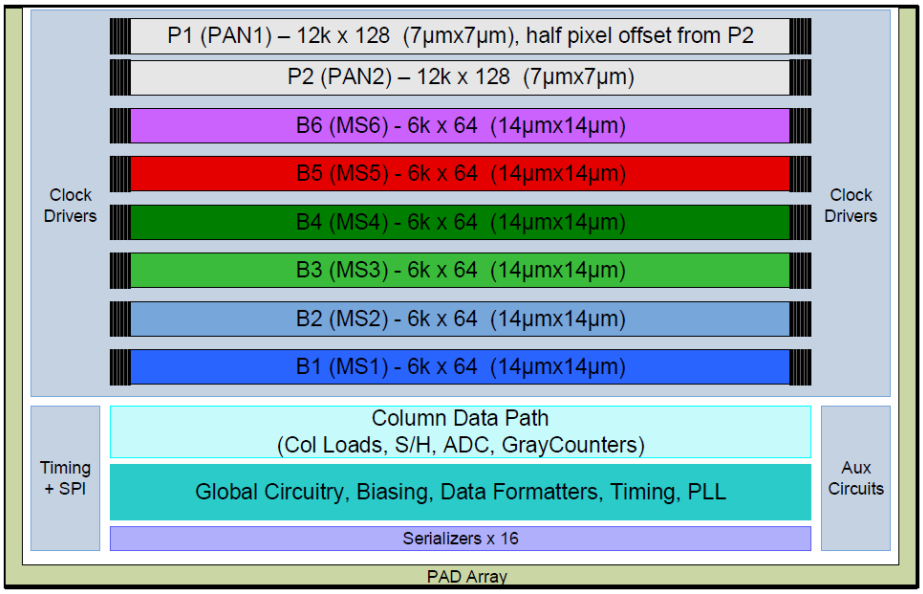
Teledyne Imaging's Orbis[51] image sensors combine charge domain TDI CCD functionality on a CMOS chip, offering the best of both technologies. With on-chip clock drivers and ADCs, these sensors offer a true integrated solution. These sensors are available both as backside illuminated (BSI) as well as front-side illuminated (FSI). These TDI CMOS image sensors include six filtered multispectral bands and two panchromatic bands, all in a single integrated CMOS die and package. With a horizontal resolution of 6144 for each multispectral band and 12288 for each panchromatic band along with lateral anti-blooming (LAB), and continuous vertical clocking, the sensors guarantee exceptional images with very high MTF. With 7µm x 7µm (P) and 14µm x 14µm (B1-B6) pixels these sensors provides extraordinary images. Two panchromatic bands with half pixel (3.5µm) offset in both horizontal and vertical directions, allow super-resolution imaging to further enhance the resolution.

	2020	2021	2022	2023	2024
Orbis[51]	TRL7	TRL8	TRL9	TRL9	TRL9

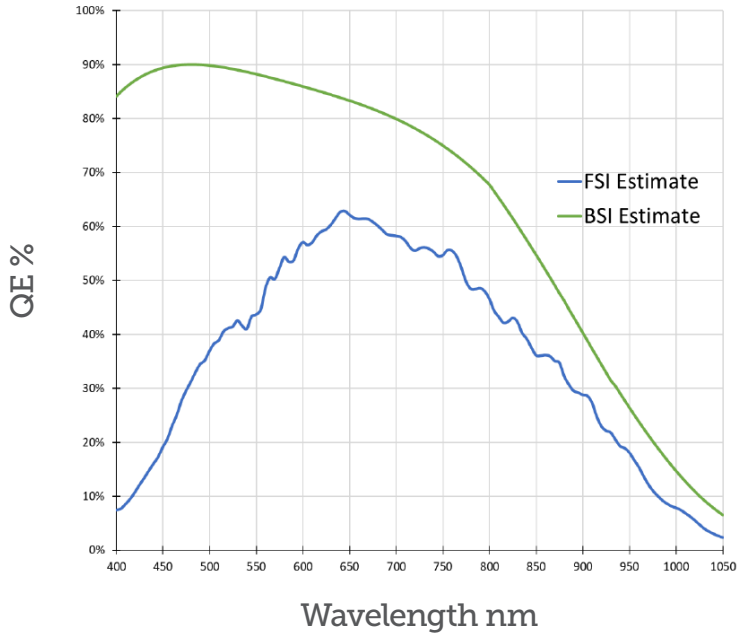
Performance Specifications	FSI	BSI
Number of pixels	P: 12288 MS: 3072	
Channels	P: 2 MS: 6	
Pixel size	P: 7µm x 7µm MS: 14µm x 14µm	
Max. line rate	P: 45.0 kHz MS: 22.5 kHz	
CTE per transfer	≥ 0.99995	
Fixed pattern noise	≤ 4% Sat (peak-to-peak)	≤ 5% Sat (peak-to-peak)
Average dark current @ 25°C	≤ 5 nA/cm^2	≤ 10 nA/cm^2
Full Well Capacity	P: 80k e- MS: 240k e-	
Noise RMS	P: ≤ 46 e- MS: ≤ 140 e-	
Read-out speed at max. line rate	Typical: 2.0 – 2.2Gb/s via CML interface @ 55MHz input master clock	
On-chip ADC resolution	12 bits	
Dynamic range	≥ 64.5 dB	
Power dissipation	Typical: ≤ 10 W	

*** Datasheets available upon request**

ARCHITECTURE



TYPICAL QUANTUM EFFICIENCY



Information subject to change – values typical unless otherwise stated.

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