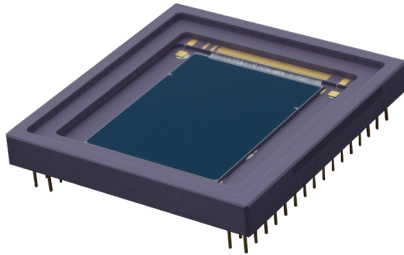


Capella^{LN / LS}

Imaging Sensors



Key Features

- » 2048 x 2048 pixels
- » 10µm x 10µm pixel size
- » 20.48 x 20.48 mm image area
- » On-chip ADC, programmable from 8 to 14 bits
- » Four LVDS data outputs at 200 MBps
- » Back illuminated
- » Rolling shutter (RS) and Global shutter (GS)
- » On-chip Correlated Double Sampling (CDS)
- » External Digital Double Sampling (DDS)
- » Good latch-up immunity and high SEU threshold by design
- » Options
 - » Anti-reflective coatings for UV to NIR
 - » Ceramic PGA package
 - » Metal PGA package
 - » 3-side butting
 - » Peltier TEC package
 - » Bonded polarizer & spectral filters
 - » HiRho
 - » Suitable for NIR applications

Typical Applications

- » Earth observation
- » Remote sensing
- » Planetary exploration
- » Space science

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.

4M Pixel General Purpose CMOS Image Sensor, Back Illuminated, Low Noise, High Full Well Capacity and Digital Output

Capella is a highly flexible CMOS image sensor platform designed for a large range of space applications. The family consists of two main variants, one for use where low noise is critical and the second designed for high signal applications. Both of these variants can be combined with a number of other options including package design and AR coatings.

Key benefits include low noise and high full well capacity sensor variants, back-illumination, with on chip analogue to digital conversion (ADC) and is therefore easy-to-use and provides excellent image quality.

Pixel read timing is set by an on-chip sequencer to simplify use and to reduce pin count. A column parallel ADC is used to quantise each row of pixels in turn and is controlled by its own sequencer. Resolution can be set from 8 to 14 bits.

Four Low-Voltage Differential Signalling (LVDS) channels output the image data and are controlled by the readout sequencer to scan along each row in turn. Two LVDS synchronisation channels allow accurate data sampling.

All configuration settings are programmed over a Serial Peripheral Interface (SPI) which also reduces the pin count with the timing control also achieved on-chip. This includes shutter mode, ADC resolution and bias current values.

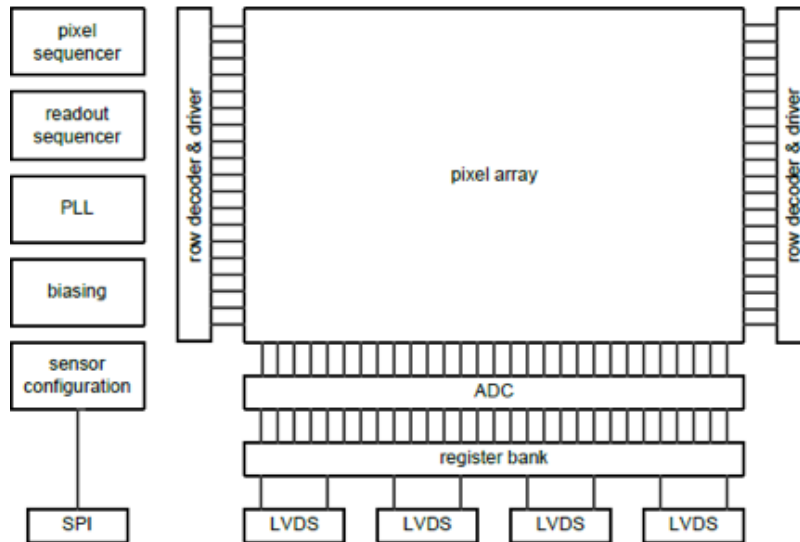
Multiple options for customisation to tailor the device to specific applications include ceramic and metal packages and patented very high resistivity silicon (HiRho) technology to improve the QE response of the sensor at higher wavelengths.

	2020	2021	2022	2023	2024
Capella ^{LN / LS}	TRL6	TRL7	TRL8	TRL9	TRL9

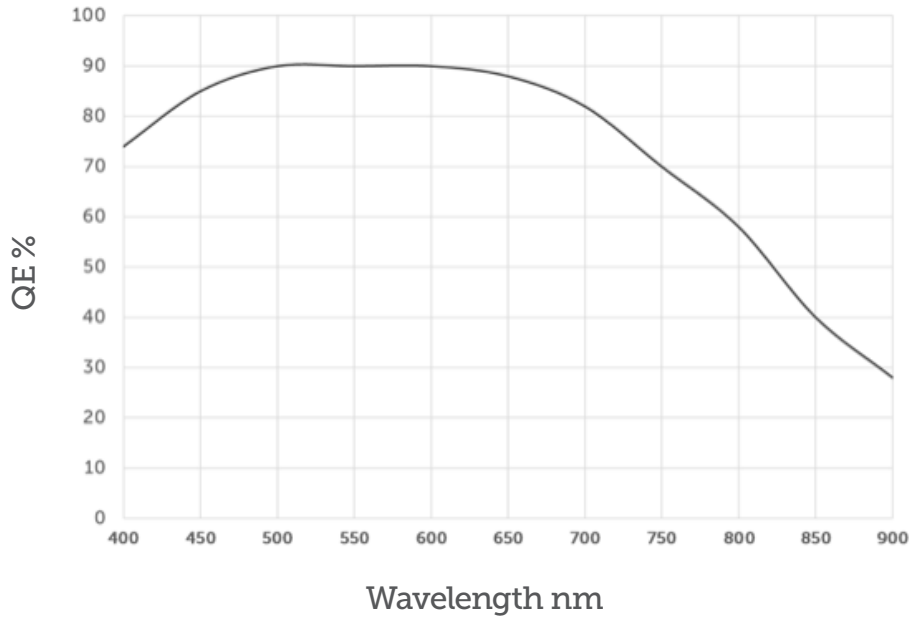
Parameter	Capella ^{LN}	Capella ^{LS}
Number of pixels	2048 x 2048	
Pixel size µm	10 x 10	
Image area mm	20.48mm x 20.48mm	
Bit depth	8/10/12/14	
Operating mode	Rolling Shutter / Global Shutter	
Frame rate	15fps @ 12 bit / 5fps for 14 bit	
QE @ 550 nm (%)	90 %	
Qsat (e-)	45000	78000
Qlin (e-)	37000	70000
Readout noise (e- rms)	7 in RS	12 in RS
Dark signal at 20C° (e-/pixel/s)	50 in RS / 300 in GS	
Power consumption (mW)	< 400	

* Datasheets available upon request

ARCHITECTURE



TYPICAL QUANTUM EFFICIENCY



Capella has been developed for use in space. By design the sensor is immune to latch-up and Single Event Upset (SEU) from charged particles up to 67 MeV·cm²/mg LET. Performance parameters will begin to change if the device is subject to ionising radiation.

Information subject to change – values typical unless otherwise stated.

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