

Monocular RGBIR 3D perception camera

RGBIR 3D demo takeaways



VB1940 at a glance



Product portfolio



Next generation in-cabin camera

In-cabin 3D mapping for occupancy & driver monitoring



Simplicity no special optics required, drop-in replacement in VB/VD1940 cameras with easy calibration

Efficiency performs well under high lighting contrasts, no additional specific illumination required

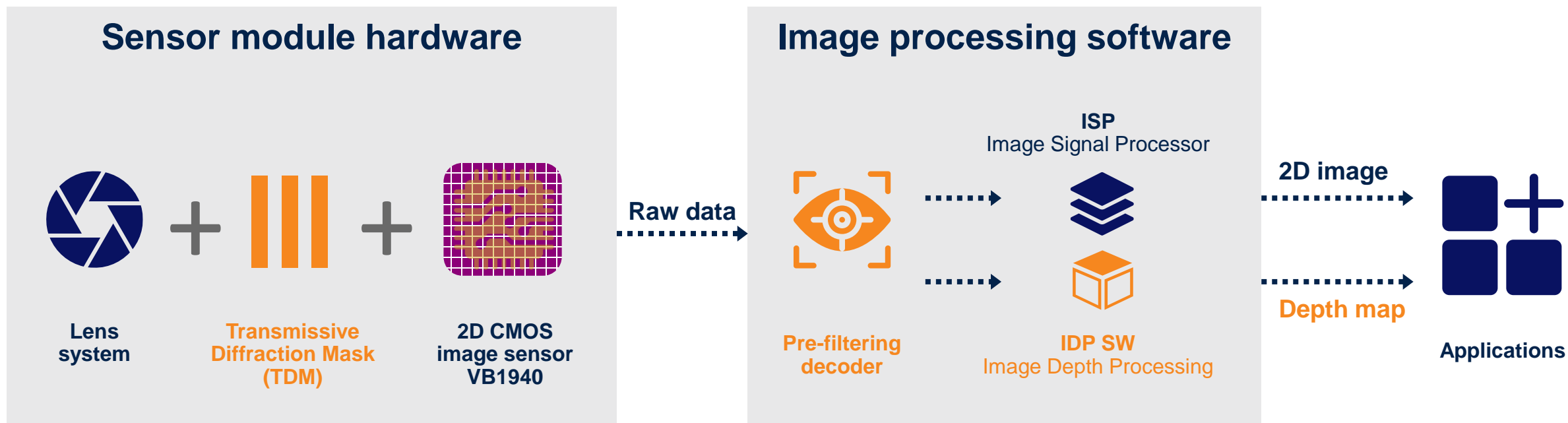
Mass-production-ready high scalability, runs on popular embedded platforms

DepthIQ pipeline overview



Sensor module + Image signal processor = 2D vision

DepthIQ pipeline overview



TDM + CMOS sensor + Lightweight algorithm = 3D vision

Cost effective

- ✓ **Low complexity** no special optics required, no additional specific illumination required
- ✓ **Ease of implementation** just drop the 2D to 3D image sensor
- ✓ **Single sensor** for 2D & 3D

Efficient

- ✓ **Compactness** the smallest 3D camera
- ✓ Keep the **2D** image sensor **resolution**
- ✓ **Accuracy** comparable to standard stereo technologies

Low processing complexity

- ✓ **Light algorithm** already ported and validated on Jetson, Snapdragon, and Rockchip

VB1940 at a glance

Best-in-class hybrid sensor with embedded cybersecurity features

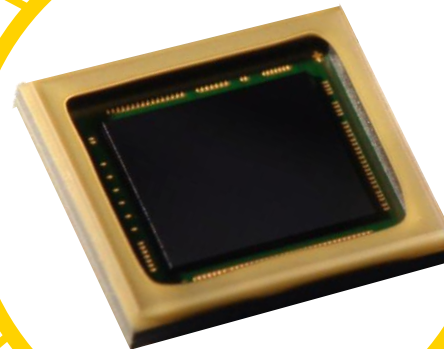
5.1Mpx resolution, **2.25 μ m** pixel size
1/2.5" optical format

BSI 3D stacked sensor (65/40nm)
5.8 mm x 4.5 mm array size

On-chip bayerization ISP
On-chip NIR smart upscale
On-chip color HDR merge

100 dB HDR in rolling shutter
Independent exposure controls (RGB and IR)

Analog subsampling (x2, x4, x32)
60 fps at full resolution



ISO26262 compliant to support
ASIL-B system integration

4 programmable contexts with
up to **32 elements**

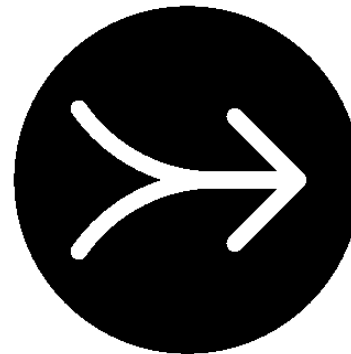
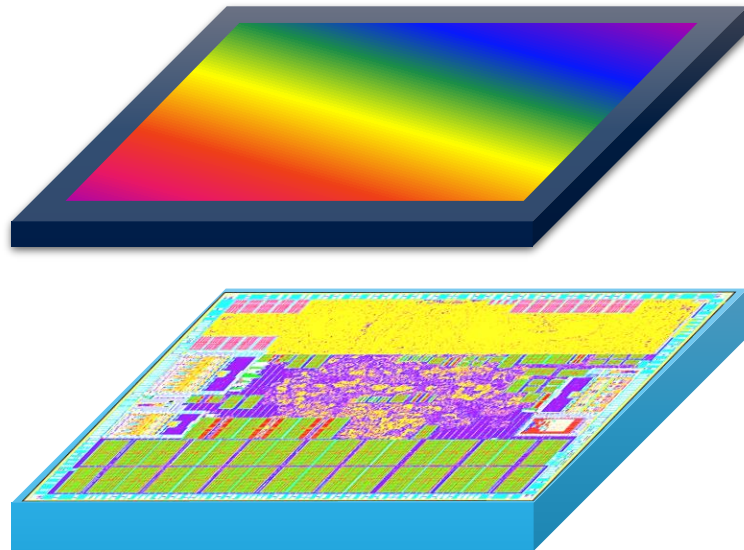
ST's unique in-house 3D stacked BSI technology

The photo-site array

Pixel is on top level wafer only
(no split over top & bottom wafer)

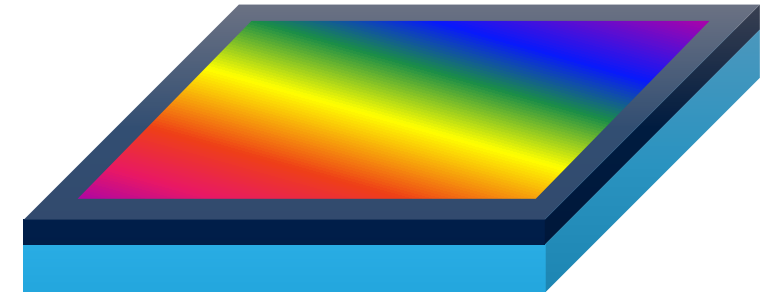


Die size is limited to optical area



The most competitive solution

Small silicon Surface & advanced processing QE boost



The low power processor

analog & digital on the whole bottom die
(no need to be placed on the surroundings)



More on-chip processing without Si increase



ST's automotive image sensors portfolio

