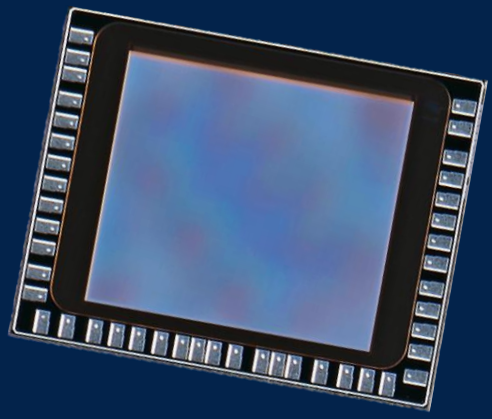
Introducing VD65G4 & VD55G4

Ultralow-power global shutter
CMOS image sensors
for always-on vision



ST Bright Sense

Expanding the ST BrightSense portfolio into always-on vision

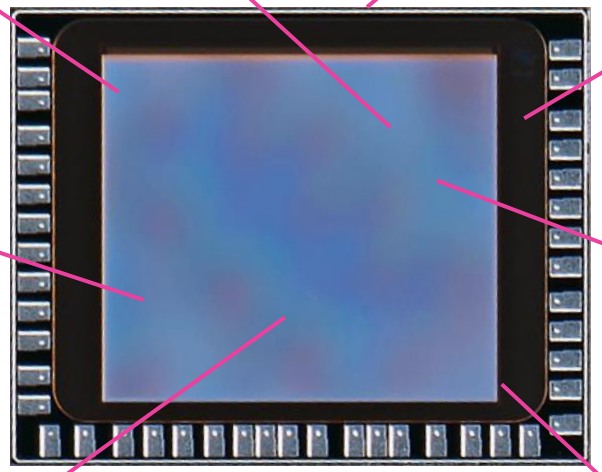
Bring intelligent sensing to your smart devices

Cutting edge 2.16 µm global shutter pixels for compact imaging

Low power and auto-wake up for battery-friendly, event-driven vision

High-sensitivity image capture from from color to near-infrared

Rich set of built-in features, such as differential mode and multi-exposure



MIPI CSI-2 image output for broad embedded processor compatibility

MIPI I3C or SPI image output for simple, low-power MCU integration

On-chip image enhancement for better images with less overhead

Available in monochrome and color RGB versions

VD65G4 & VD55G4

ST BrightSense portfolio

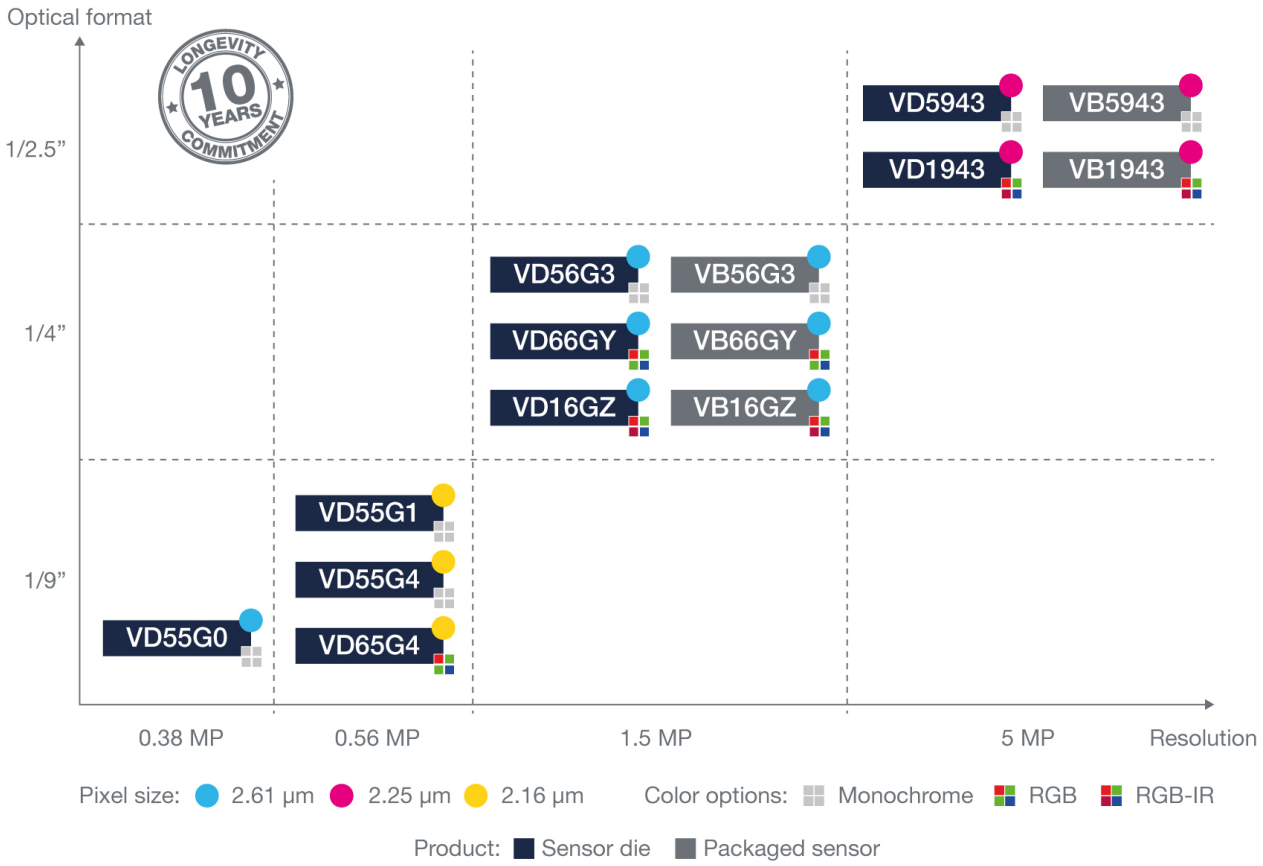
A broad and growing CMOS image sensors offer

Partner with an experienced and reliable industry leader

- Patented technologies awarded by top players
- Proven supply chain with billions of units shipped
- Comprehensive imaging portfolio (CIS, ALS, dTOF, iTOF)

Build smart and power-efficient vision systems

- Extend battery time with low power & auto-wake up
- Optimize processing through smart in-sensor features
- Maximize ergonomics and size with slim sensor designs



ST BrightSense overview

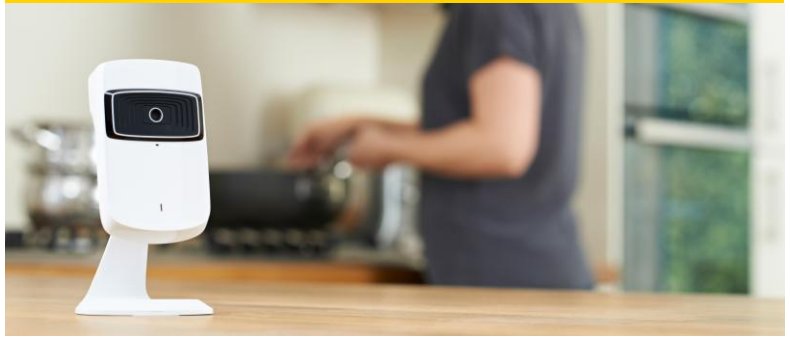
Bring computer vision to the next level

Build up precise & responsive systems
Capture high-quality images in any condition with our advanced pixels

Reveal the unseen
Benefit from the sensors' superior sensitivity and sharpness from visible to near-infrared

Stay at the forefront of innovation
Benefit from patented state-of-the-art technologies from ST's proprietary wafer fab

Create smart & power-efficient vision solutions

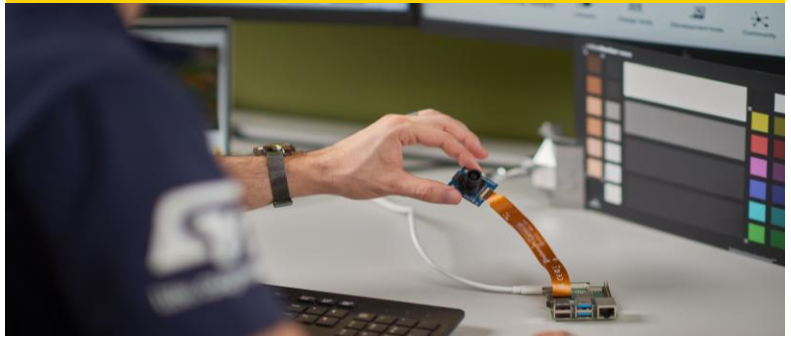


Develop innovative functionalities
Use on-chip features to develop distinctive capabilities while reducing processing load

Designed to fit in everywhere
Rely on ultra-compact sensors to build tiny, discreet embedded vision systems

Extend battery life in mobile systems
Use low operating power and auto-wake up feature to get rid of inefficient 24/7 operation

Save resources and accelerate time-to-market



Everything you need in a few clicks
Manuals, reference designs & turnkey hardware for various platforms

Effortless evaluation & development
Use turnkey drivers with optimized ISP configuration to maximize image quality

Support from prototype to production
Wide set of evaluation camera modules available in production from various partners

A comprehensive development ecosystem

A broad range of complementary deliverables

Open product documentation

Turnkey evaluation tools

Free software tools & drivers

Experienced ST Partners

Knowledge base and community

Everything needed to speed up your projects

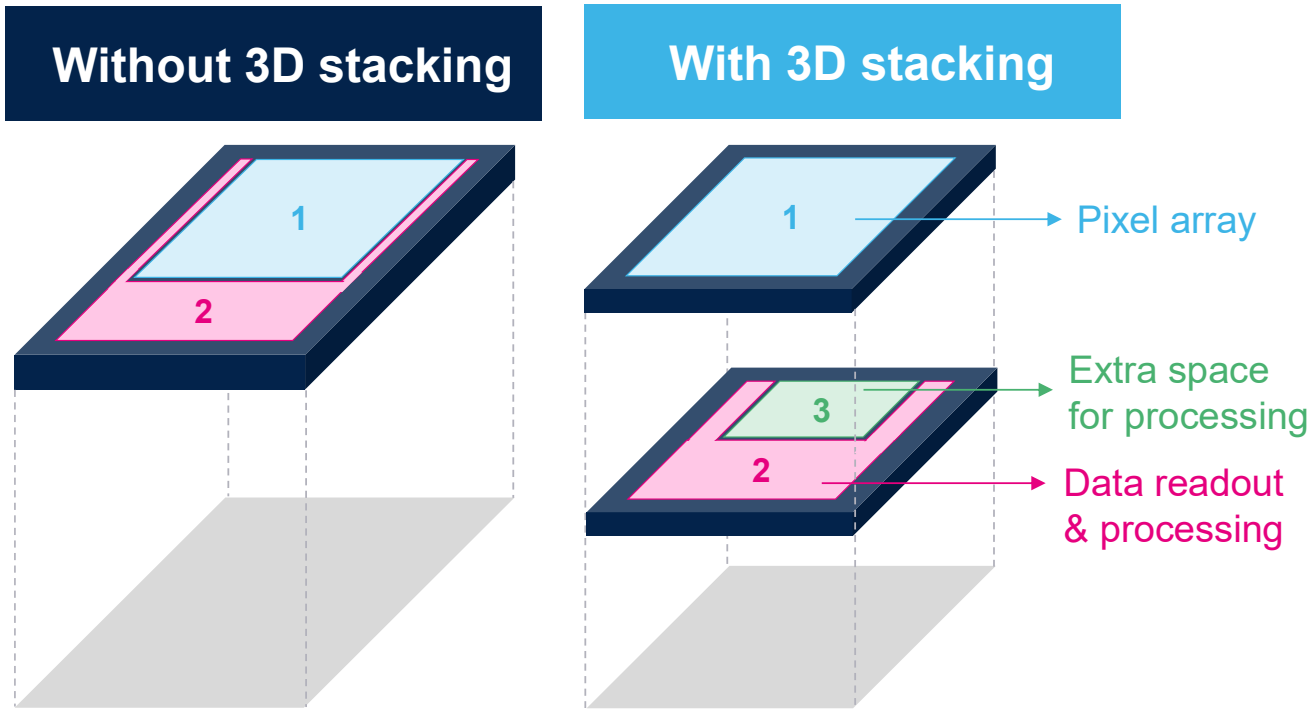
Product evaluation	Hardware prototyping	Application development	Software integration	Mass production
• Open datasheet • Evaluation kit • Evaluation software	• Development kits • Camera modules • Board reference designs	• Comprehensive SDK • Example software • Software partners	• Open user manual • Software drivers • Getting started tutorials	• Camera module partners • High to low volume support • Longevity program

Experience always-on awareness

Complete toolbox of on-chip features

Enabling smarter and low-power system designs

ST BrightSense products feature further **3D-stacking** technology through **advanced image processing features** that free up processor resources for critical tasks and enhanced functionality in a reduced footprint.



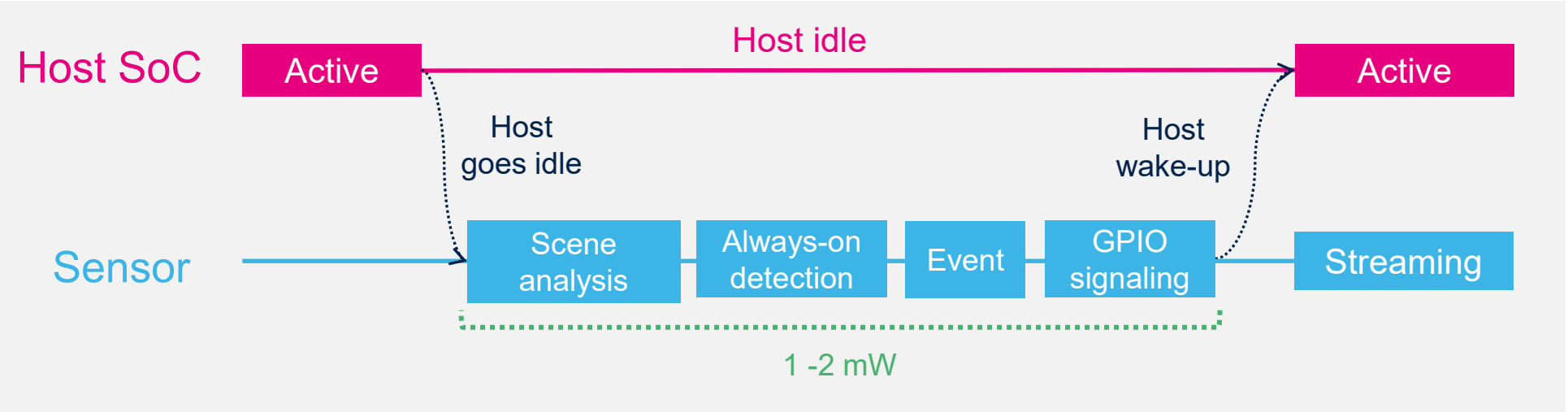
On-chip features

- Autoexposure
- Auto Wake-Up
- Background removal
- Binning
- Context management
- Defective pixel correction
- Spatial multi-exposure (HDR)
- Image difference mode
- Noise reduction
- 4x4 configurable statistics
- …

Low-power, auto-wakeup for event-driven vision

Say goodbye to inefficient, power-hungry always-on systems

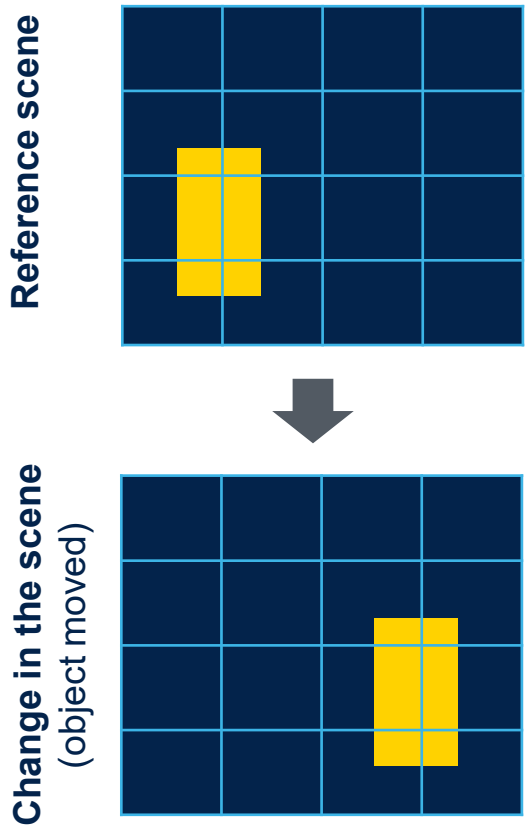
With **auto wake-up,** the sensor **autonomously detects actions or scene changes in low power**; while the host remains idle state to reduce power consumption at system level.



Once a change is detected, a GPIO signal raises an event to the host, which can then enable the full streaming of the image.

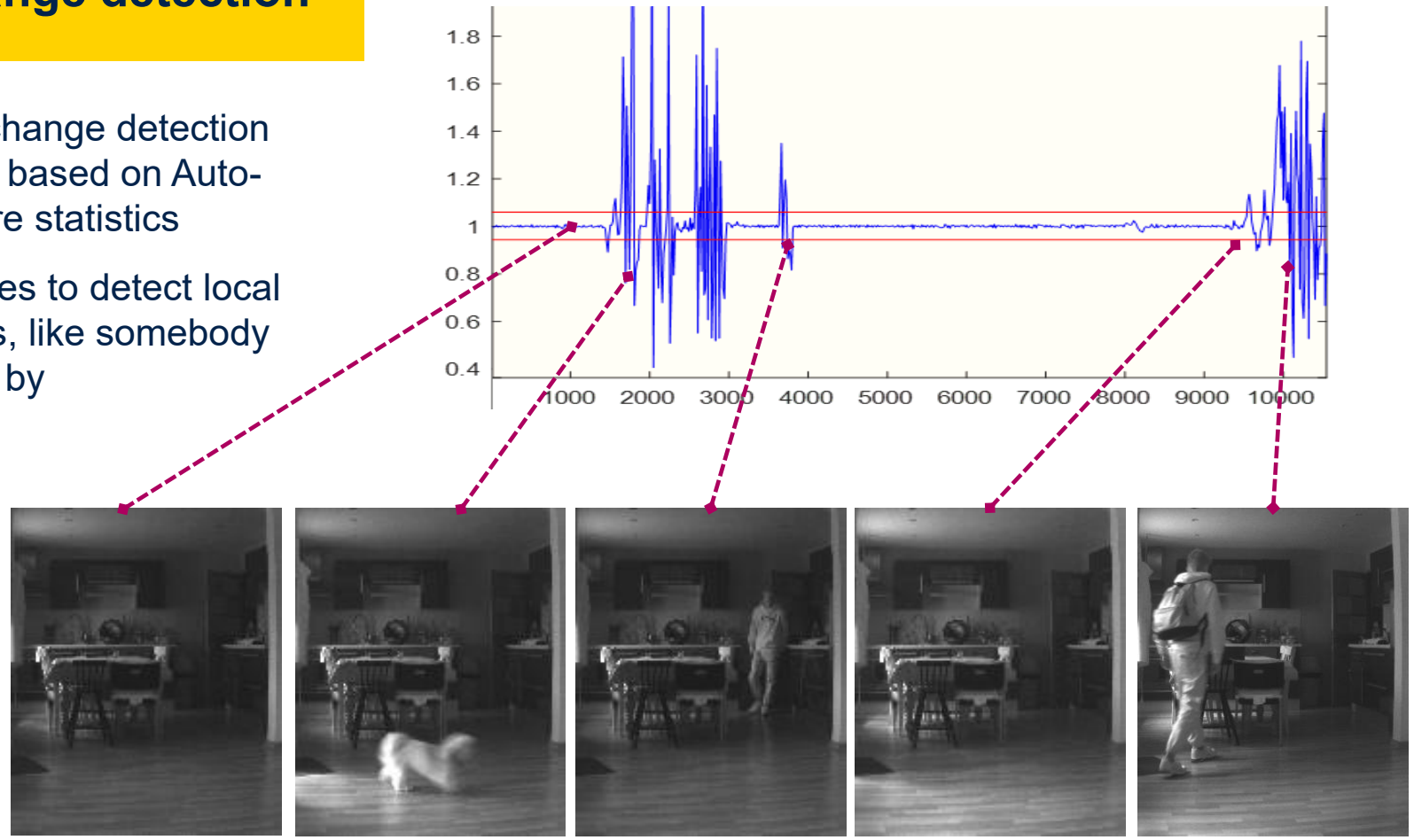
Low-power, auto-wakeup for event-driven vision

Based on autonomous scene change detection



- Scene change detection scheme based on Auto-Exposure statistics
- 4x4 zones to detect local changes, like somebody passing by

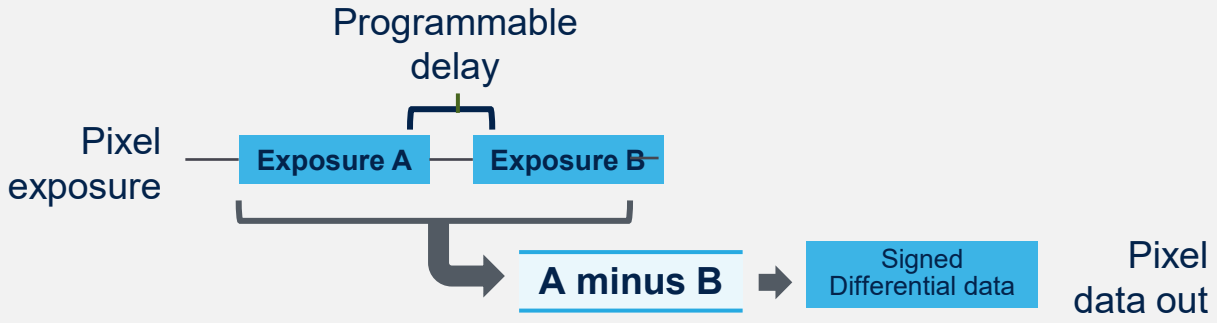
Detections at relevant moments



12-minutes recording (1fps)

Built-in image difference & background removal

Pre-processed vision for motion and segmentation



Leveraging in-pixel subtraction capabilities

Differential image outputs

Interlacing of image and differential image

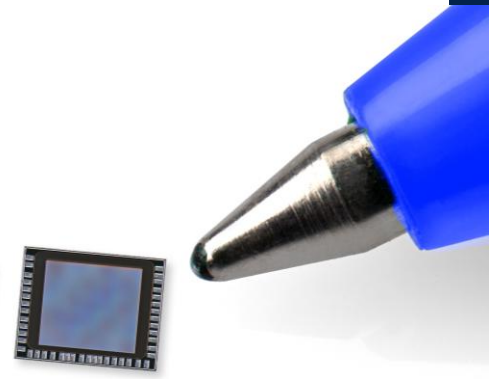
Image difference

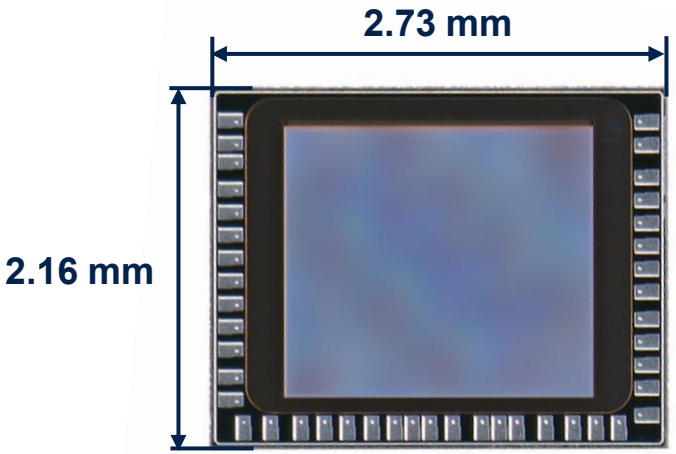
Background removal

Small footprint. Maximum discretion.

Maximum performance in a tiny format

- Industry-leading 2.16 µm global-shutter pixel for compact, high-sensitivity imaging from visible to NIR
- Superior sensitivity and sharpness with BSI and CDTI technologies for high-performance embedded vision
- High-speed, artifact-free image capture with global shutter, supporting up to 184 fps at full resolution
- Higher-than-VGA resolution (800 x 700) in a compact 1/9” optical format for ultra-compact vision-based devices

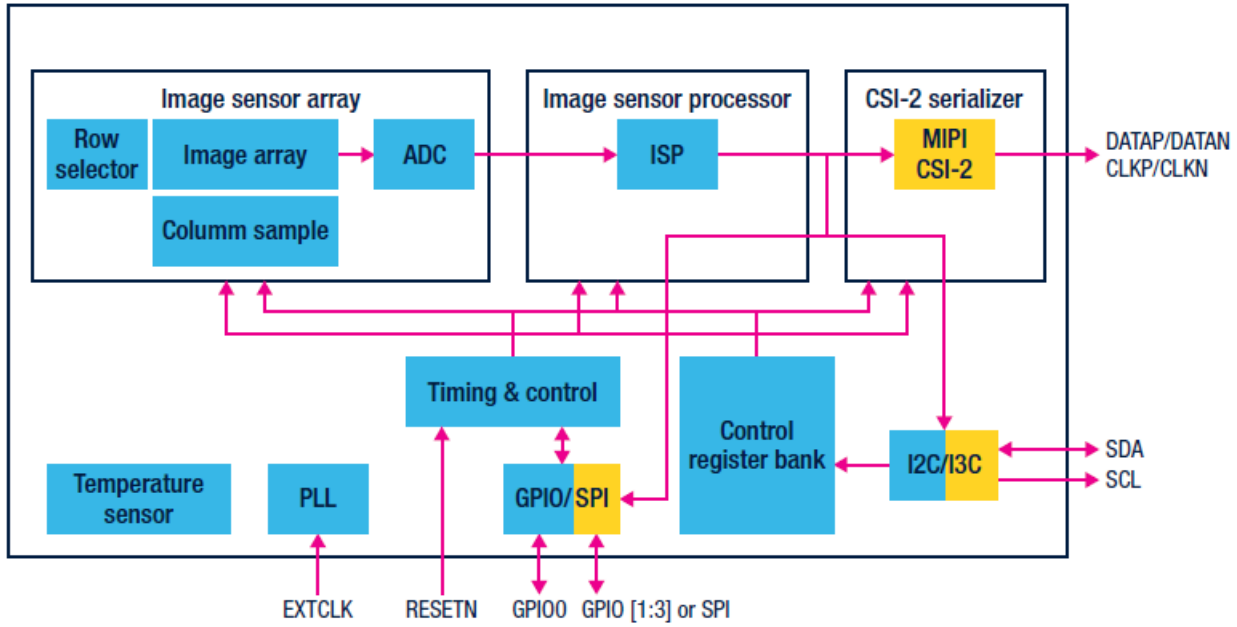




Flexible connectivity for every use case

Choose between MIPI CSI-2, I3C or SPI interface

VD65G4 / VD55G4 Simplified Block Diagram



MIPI CSI-2

Built for fast, high-quality imaging

A widely adopted camera interface for embedded SoCs and ISP-based designs, ideal for high-speed capture at 1.5 Gbps.

MIPI I3C

The smart interface for next-generation MCUs

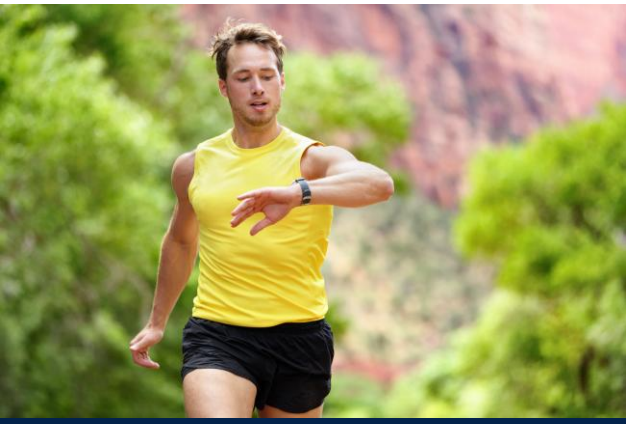
With only 2 wires and 12.5 Mbps, it enables compact designs, multi-sensor support, and event-driven vision.

SPI

Simple, flexible, and widely supported

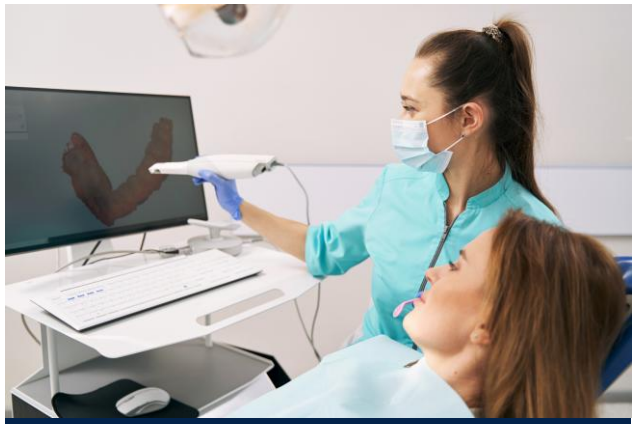
A proven choice for many microcontrollers and low-power SoCs, offering 42 Mbps over just 4 wires.

Bringing smart vision to the edge in…



Wearables

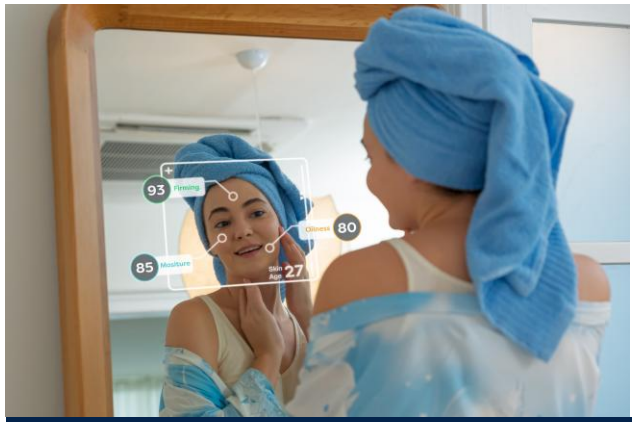
XR/VR/AR headsets



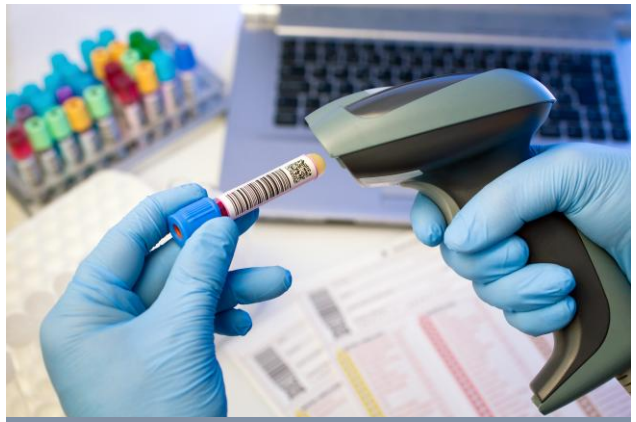
Medical devices

Smart building & Security

Smart glasses



Home appliances



Barcode scanning

Edge AI vision

Features overview

Category	Parameters	Specifications
Optical	Resolution	0.56 MP
	Pixel array – H x V	804 x 704
	Aspect ratio	Close to 1 : 1
	Optical format	1/9'' (2.3mm)
	CRA	30°
Pixel	Pixel size	2.16 µm
	Shutter type	Global
	Technology	BSI, CDTI, 3D stacking
Electronic	Frame rate max	184 fps at full resolution
	Output interface	MIPI CSI-2 or I3C or SPI
	Output format	RAW8, RAW10
	Control interface	I²C or I3C
	Supply voltages	VCORE 1.1 V | VDDIO 1.2 V or 1.8 V | VANA 2.8 V
Mechanical	Die dimension – H x V	2.73 x 2.16 mm²
Options	Chroma	Monochrome or RGB
	Deliverable	Die in reconstructed wafer

Embedded features:

- Auto-wakeup
- Image difference
- Background removal
- Multi-exposure
- Image statistics
- Noise reduction
- Gamma correction
- Dark calibration
- Defective pixel correction
- Cropping
- Binning
- Sub-sampling
- Mirror/Flip
- Context management
- GPIOs x4
- Temperature sensor

And more

Get started with VD65G4 and VD55G4

Ordering codes

The VD65G4 and VD55G4 sensors are now available to early adopters.

Category	Deliverable	Ordering code	Description
Sensors	VD65G4 Sensor die	VD65G4CCC0/RW	800x700 **color sensor**, bare die in reconstructed wafer
	VD55G4 Sensor die	VD55G4CCC0/RW	800x700 **monochrome sensor**, bare die in reconstructed wafer
Evaluation camera modules	CAM-65G4 Promodules	**Soon available for online purchase**	
	CAM-55G4 Promodules	**Soon available for online purchase**	
Evaluation boards	VD65G4 S-Board	**Soon available for online purchase**	
	VD55G4 S-Board	**Soon available for online purchase**	
	P-Board	STEVAL-CAM-M0I1	Generic evaluation board for any promodule with MIPI CSI-2 output
	EVK Main	STEVAL-EVK-U0I1	Generic evaluation board for connecting any S-Board or promodule to computer with USB3 output

To learn more and request detailed documentation, evaluation kits, or product samples, reach out to your local ST sales representative or an authorized distributor.

A comprehensive ecosystem

Available soon for VDx5G4 – Stay tuned

A broad range of complementary deliverables

Open product documentation

Turnkey evaluation tools

Free software tools & drivers

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Everything needed to speed up your projects

Product evaluation	Hardware prototyping	Application development	Software integration	Mass production
• Open datasheet • Evaluation kit • Evaluation software	• Development kits • Camera modules • Board reference designs	• Comprehensive SDK • Example software • Software partners	• Open user manual • Software drivers • Getting started tutorials	• Camera module partners • High to low volume support • Longevity program

Our technology starts with You

Find out more at st.com/vd65g4
st.com/vd55g4