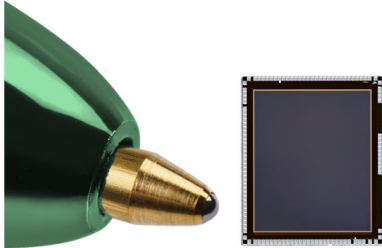


## Compact and high-sensitivity 1.5 megapixel RGB-IR global shutter image sensor



Order code	Description
VD16GZCCA/RW	RGB-IR, bare die as reconstructed wafer

### Features

- Cutting-edge performance of ST proprietary pixel:
  - BSI structure provides superior QE, MTF, and angular response.
  - Full DTI technology further increases sensitivity and sharpness.
  - Benefit both color and NIR (850 nm, 940 nm) image capture.
  - Proprietary technology from ST foundry in France, ensuring a safe supply.
- Easy integration into your system:
  - Ultra-compact die with centered design to minimize your system size.
  - Small optical format: 4.6 mm (1/4") at full resolution and 3.7 mm (1/5") with 1 MP crop.
  - Low power, ideal for battery-powered devices.
  - Robust design and image quality in temperature.
- A complete toolbox of in-sensor features:
  - Stunning images with in-sensor autoexposure and various corrections.
  - Multiple features to optimize data size and frame rates such as crop, and programmable sequences.
  - 8 GPIOs enabling extra controls such as trigger or LED synchronization.
- Seamless connection to embedded processing platforms:
  - 1 or 2 lanes MIPI CSI-2 interface enabling straight connection to entry-level cost-effective processing platforms.
  - Start immediately your development with our turnkey sensor boards, modules, and drivers for VD16GZ image sensor.
- The VD16GZ color and near-infrared image sensor is also available in monochrome version ([VD56G3](#)) and color RGB version ([VD66GY](#)).

### Description

The VD16GZ is part of the new generation of image sensors developed by STMicroelectronics for professional and consumer vision applications. Leveraging state-of-the-art technologies developed by ST's own foundry, the sensor provides outstanding performance in color and near-infrared. With its RGB-IR pattern, the VD16GZ is perfectly suited for multispectral imaging and for the many applications requiring the simultaneous capture of both color and near-infrared images.

### Application

- Home and service robots
- Smart appliances
- Agriculture
- Drones and UAVs
- Industrial robots and AGVs
- Quality inspection
- 3D stereo imaging
- Security and biometrics

# 1 Technical specifications summary

**Table 1. Technical specifications**

Category	Parameter	VD16GZ specifications
Resolution	Resolution	1.53 MP
	Pixel array [H x V]	1124 x 1364
	Aspect ratio	5:6
Pixel	Shutter type	Global shutter
	Illumination type	Back side illuminated (BSI)
	Pixel size	2.61 $\mu\text{m}$
Color	Color option	RGB-IR
Frame rates (maximum)	Full resolution	88 fps
	1 MP resolution	121 fps
	VGA resolution	237 fps
Optical characteristics	Pixel array size [H x V]	2.93 mm x 3.56 mm
	Optical format	1/4" (4.61 mm)
	CRA	30° linear
Mechanical characteristics	Die footprint [H x V]	3.65 mm x 4.34 mm
	Die centering (optical vs. mechanical)	Yes
	Die pinout	115 pins
	Operating temperature range	-30 to +85°C
Electronic characteristics	Sensor data interface	MIPI CSI-2   1 or 2 lanes
	Sensor control interface	I <sup>2</sup> C, up to 1 Mbps/s
	Output format	RAW8, RAW10
	Supply voltages	2.8 V – 1.8 V – 1.15 V
	External clock frequency	6 to 27 MHz
	Power consumption	120 mW (60 fps)   4 mW (Standby)
Embedded features	Image quality optimization	<ul style="list-style-type: none"> <li>• Autoexposure</li> <li>• Automatic dark calibration</li> <li>• Analog and digital gains</li> </ul>
	Data and frame rate optimization	<ul style="list-style-type: none"> <li>• Cropping</li> <li>• Context management with up to 4 contexts</li> </ul>
	Others	<ul style="list-style-type: none"> <li>• Mirror/Flip</li> <li>• Test pattern generation</li> <li>• Temperature sensor</li> <li>• 8 programmable GPIOs for LED control, PWM control, autonomous or controlled external frame start</li> </ul>

## Revision history

**Table 2. Document revision history**

Date	Version	Changes
30-Jan-2023	1	Initial release
19-Dec-2023	2	Updated document title Updated order code Updated application Updated Features Updated Description Added <a href="#">Section 1: Technical specifications summary</a>

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