Automotive grade 1.5 megapixel backside illuminated global shutter image sensor

Reference	Description
Order code	VB56G4ACGK
Package	OBGA 6.2 mm x 6.9 mm
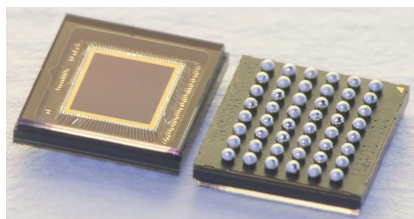
Features

Automotive compliancy

- AEC-Q100 grade 2 qualified
- Operating junction temperature: -40°C to 125°C

Ultra compact 1.5 megapixel image sensor

- Global shutter architecture, 3D stacked sensor 40 nm/65 nm
- 2.61 µm x 2.61 µm BSI (backside illuminated) pixel
- 1.5 megapixel monochrome sensor (1124 x 1364)
- Package: OBGA
  - Size: 6.2 mm x 6.9 mm
  - Matrix: 6 x 8 balls
  - Ball pitch: 0.8 mm

Easy integration

- Embedded autoexposure
- Programmable sequences of 4-frame contexts
- 8 programmable GPIOs
  - NIR (near infrared) illumination control outputs, synchronized with sensor integration periods
  - PWM (pulse-width modulation) control
  - Master/Slave external frame start
- Automatic dark calibration
- Dynamic pixel-defective correction
- Image cropping
- Mirror/flip readout
- Binning and subsampling (x2 and x4)
- Typical power consumption is 145 mW at 60 fps
- Dual lane transmitter MIPI CSI-2 up to 1.5 Gbps per lane

Unique image performance

- Peak quantum efficiency 24% @ 940 nm
- Linear dynamic range up to 60 dB
- Up to 88 frames per second at full resolution

For further information contact your local STMicroelectronics sales office.

Description

The VB56G4A is a 1.5 megapixel global shutter image sensor designed for automotive driver monitoring applications.

Using pre-eminent 3D stacking and ST patented processes, the sensor performs outstandingly in the near infrared region (940 nm). More precisely, thanks to backside illumination technology and its excellent sensitivity, the VB56G4A can be operated with one simple LED or VCSEL.

1 Overview

The VB56G4A is a 1.5 megapixel image sensor that produces raw digital video data on a MIPI CSI-2 output interface.

The image data are digitized using internal 10-bit ADCs. The resulting pixel pattern is output as either RAW10 or RAW8 data.

The device is fully configurable through the I²C serial interface, and provides flexible frame-to-frame configuration changes via the use of programmable contexts.

The VB56G4A has a wide, nonvolatile memory (NVM) and embedded temperature sensor. The device also has general-purpose input/output (GPIO) signals. They can be used to enable synchronization of several sensor readouts or to control strobe light sources during exposure time.

Figure 1. Functional block diagram
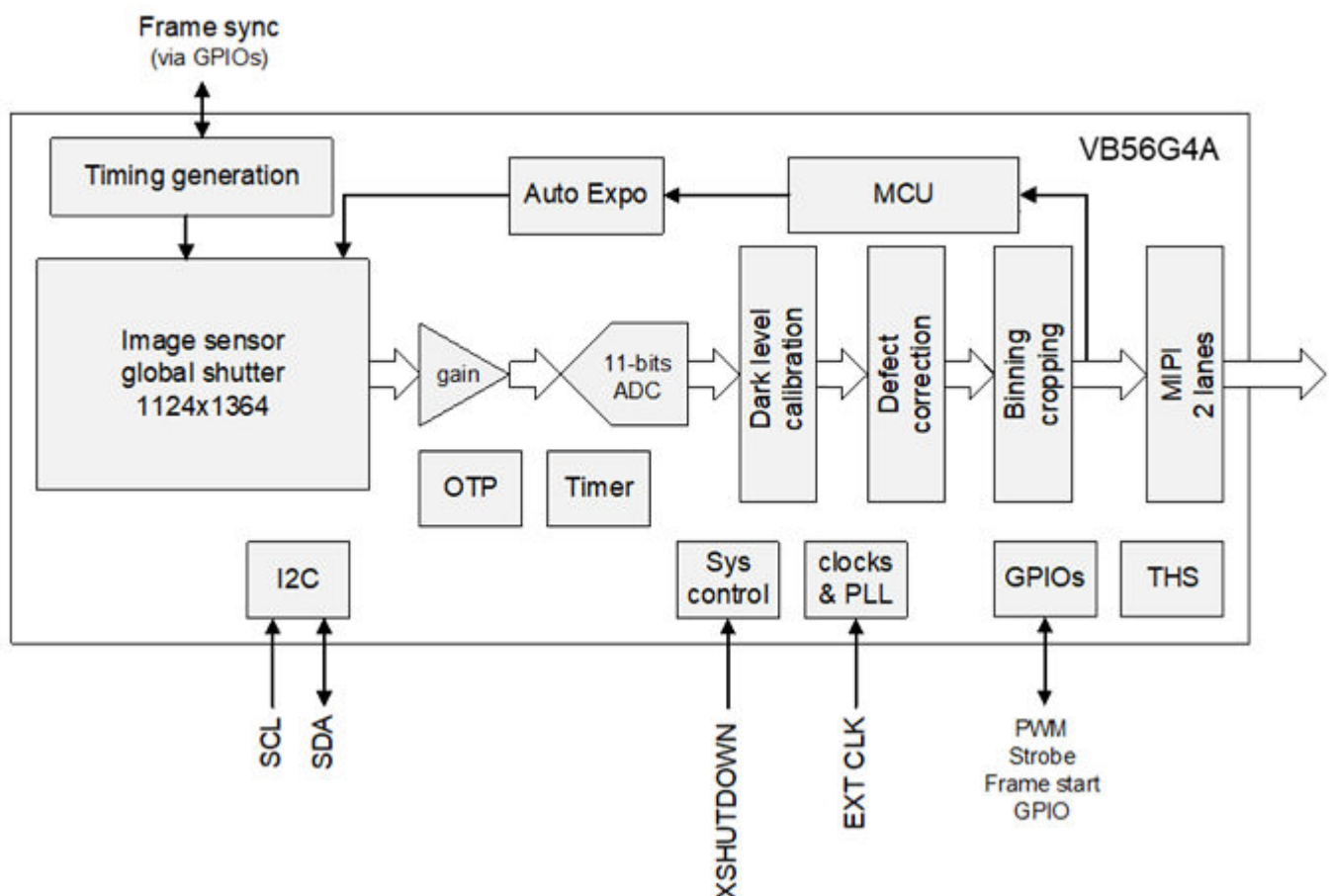
Revision history

Table 1. Document revision history

Date	Version	Changes
15-Apr-2022	1	Initial release
19-Mar-2024	2	Updated device summary table.

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