



OV50H

50-megapixel product brief



Flagship Low-Light and Autofocus Performance for Rear-Facing Smartphone Cameras

OV50H is a high-resolution 50-megapixel (MP) image sensor with a dual conversion gain (DCG™) technology powered 1.2-micron (µm) pixel in a 1/1.3-inch optical format, designed for high-end smartphone rear-facing cameras. The OV50H offers flagship-level low-light and autofocus performance, supports 12.5MP at 120 frames per second (fps) and high dynamic range (HDR) at 60 fps and is OMNIVISION's first sensor to feature horizontal/vertical (H/V) quad phase detection (QPD).

The OV50H is built on OMNIVISION's PureCel®Plus-S stacked-die technology for best-in-class image sensor performance. It features OMNIVISION's first H/V QPD

autofocus technology. QPD enables 2x2 phase detection autofocus (PDAF) across the sensor's entire image array, and H/V mode ensures that both horizontal and vertical orientations are in the same frame with 100% coverage. This feature improves distance calculation, provides faster autofocus and enhances low-light performance. In combination with on-chip remosaic for the QPD color filter array, the result is premium image quality for the wide and ultrawide rear-facing cameras in flagship and high-end smartphones.

Find out more at www.ovt.com.



- OV50H40-GA5A-004A-Z (color, chip probing, 150 µm backgrinding, reconstructed wafer with good die)

Applications

- smart phones
- video conferencing
- PC multimedia

Technical Specifications

- active array size:** 8192 x 6144
- maximum image transfer rate:**
 - 8192 x 6144: 30 fps
- power supply:**
 - core: 1.2V
 - analog: 2.8V
 - I/O: 1.8V/1.2V
- power requirements:**
 - active: 1395 mW (50MP @ 30 fps)
 - XSHUTDOWN: < 10 µA
- output formats:** 10/12/14-bit RGB RAW
- temperature range:**
 - operating: -30°C to +85°C junction temperature
 - stable: 0°C to +60°C junction temperature
- lens size:** 1/1.3"
- lens chief ray angle:** 36.9° non-linear
- scan mode:** progressive
- pixel size:** 1.197 µm x 1.197 µm
- image area:** 9844.128 µm x 7430.976 µm

Product Features

- automatic black level calibration (ABLC)
- programmable controls for:
 - frame rate
 - mirror and flip
 - binning
 - cropping
 - windowing
- support for dynamic DPC
- supports output formats:
 - 10-bit RGB RAW
 - 12/14-bit RGB RAW after DCG combination
- supports horizontal and vertical subsampling
- supports typical images sizes:
 - 8192 x 6144
 - 4096 x 3072
 - 4096 x 2304
 - 1920 x 1080
 - 1280 x 720
- standard serial SCCB interface
- up to 4-lane MIPI TX interface with speeds up to 3.0 Gbps/lane
- 2/3 trio C-PHY interface, up to 3.5 Gbps/trio
- high gain mode support, up to 63.75x for full resolution and 255x for 4-cell binning SCG mode
- supports type 2 QPD PDAF
- HDR support:
 - DCG RAW or combined RAW
 - stagger HDR 2/3 exposure timing
 - DCG RAW or DCG combined RAW + VS RAW
- on-chip QPD to Bayer converter
- three on-chip phase lock loops (PLLs)
- programmable I/O drive capability
- built-in temperature sensor
- 1.197 µm pixel

Functional Block Diagram

