



OV50E



50 megapixel product brief

New 50MP Image Sensor Brings Industry-leading Low Light Still Image and Ultra High Dynamic Range Video to Rear Facing Smartphone Cameras

The OV50E image sensor brings the industry's best low light image and high dynamic range (HDR) video capturing capabilities to rear-facing main cameras in high-end and mainstream smartphones. The OV50E features staggered HDR and DCG™ technology for improved HDR and crop zoom support, 100% quad phase detection (QPD) for enhanced autofocus, and better low light performance over previous-generation image sensors. The new OV50E combines 50MP resolution and 1.0 μm pixel size in a 1/1.5-inch optical format.

The OV50E can achieve up to 64x analog gain for full resolution, or 256x analog gain for 4 cell binning resolution. Built on OMNIVISION's PureCel®Plus-S stacked die technology, the OV50E can also use near-pixel binning to output a 12.5MP image or 4K2K video with four times the sensitivity, yielding 2.0 μm -equivalent performance for preview and video. The maximum dynamic range reaches more than 100 dB.

The OV50E's second-generation QPD enables 2x2 phase detection autofocus across the sensor's entire image array for 100% coverage, resulting in improved distance calculation, faster autofocus and better low-light performance. Premium image quality is further enabled by the combination of on-chip remosaic for the QPD color filter array to full Bayer resolution.

Output formats include 50MP, or 8K video, with QPD autofocus at 30 frames per second (fps); 12.5MP with QPD autofocus at 60 fps; 4K2K video with QPD autofocus at 60 fps; and 1080p at 240 fps. The OV50E supports the CPHY/DPHY MIPI interface and dual DOVDD 1.8/1.2V.

Find out more at www.ovt.com.



- OV50E40-GA5A-4A-Z (color, chip probing, 150µm backgrinding, reconstructed wafer with good die)

Applications

- smart phones
- video conferencing
- PC multimedia

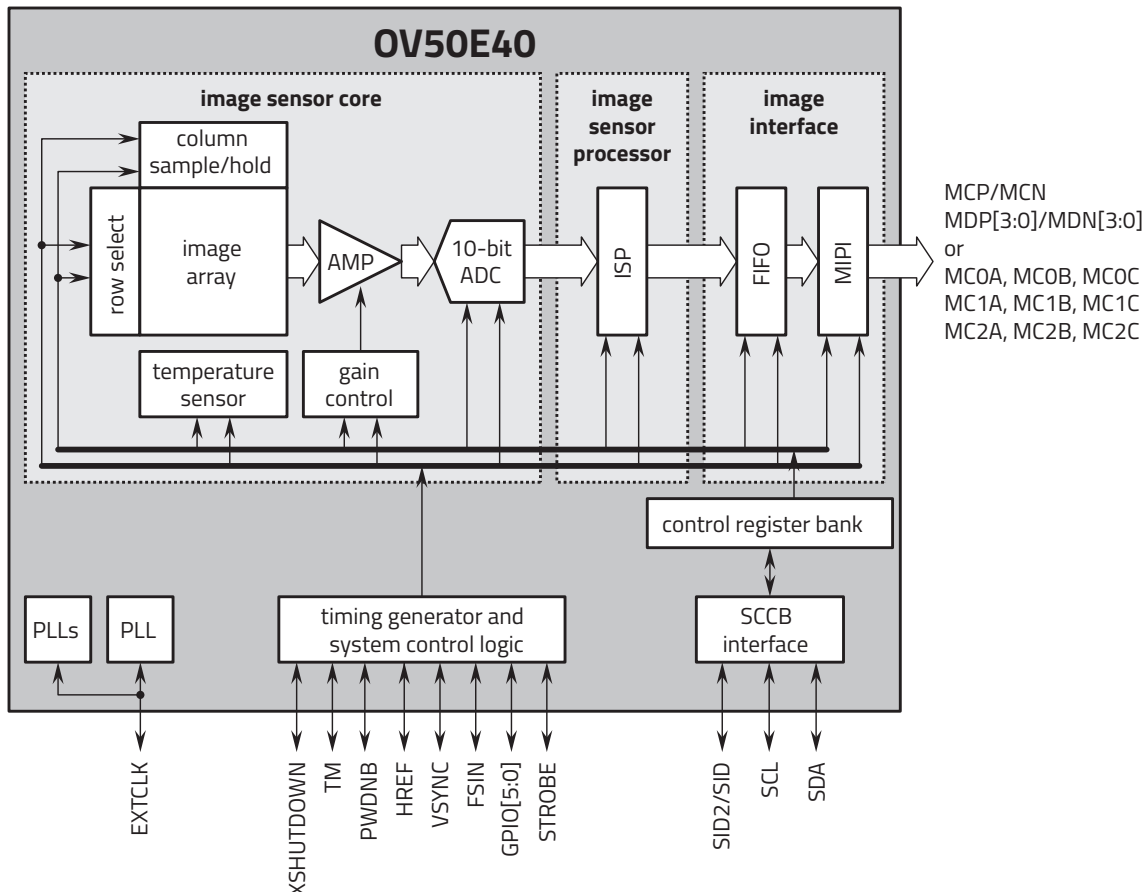
Technical Specifications

- active array size:** 8224 x 6176
- maximum image transfer rate:**
 - 8192 x 6144: 30 fps
- power supply:**
 - core: 1.1V
 - analog: 2.8V
 - I/O: 1.8V/1.2V
- power requirements:**
 - active: TBD (50MP @ 24 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:** 1/1.55"
- lens chief ray angle:** 36.75° non-linear
- scan mode:** progressive
- pixel size:** 1.008 µm x 1.008 µm
- image area:** 8289.792 µm x 6225.408 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
- 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
- 1.008 µm pixel

Functional Block Diagram



Version 1.0, August 2022

