OV50K40

50-megapixel product brief

Smartphone Sensor Features TheiaCel™ Technology for High and Stable Single Exposure HDR Image Capture

The new OV50K40 is the first smartphone image sensor with TheiaCel™ technology, which harnesses the capabilities of lateral overflow integration capacitors (LOFIC) to provide the best-in-class single-exposure high dynamic range (HDR) regardless of lighting conditions. The OV50K40 CMOS image sensor achieves human eye-level HDR with single exposure in standard mode, setting a high-performance bar for flagship rear-facing main cameras.

The OV50K40 is a 50-megapixel (MP) image sensor that features a 1.2-micron (µm) pixel in a 1/1.3-inch optical format with high gain and correlated multiple sampling (CMS) for optimal performance in low-light conditions. It supports 4-cell binning for 12.5MP at 120 frames per second (fps) and 60 fps with HDR, with 4x sensitivity. Quad phase detection (QPD) enables ultra-fast autofocus performance. An on-chip QPD re-mosaic provides full 50MP Bayer output, premium-quality 8K video and 2x crop-zoom functionality.

The OV50K40 has now entered the mass production phase.

Find out more at www.ovt.com.

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OV50K40

Ordering Information

- **OV50K40-GA5A-004A-Z** (color, chip probing, 150 µm backgrinding, reconstructed wafer with good die)

Applications

- smart phones
- video conferencing
- PC multimedia

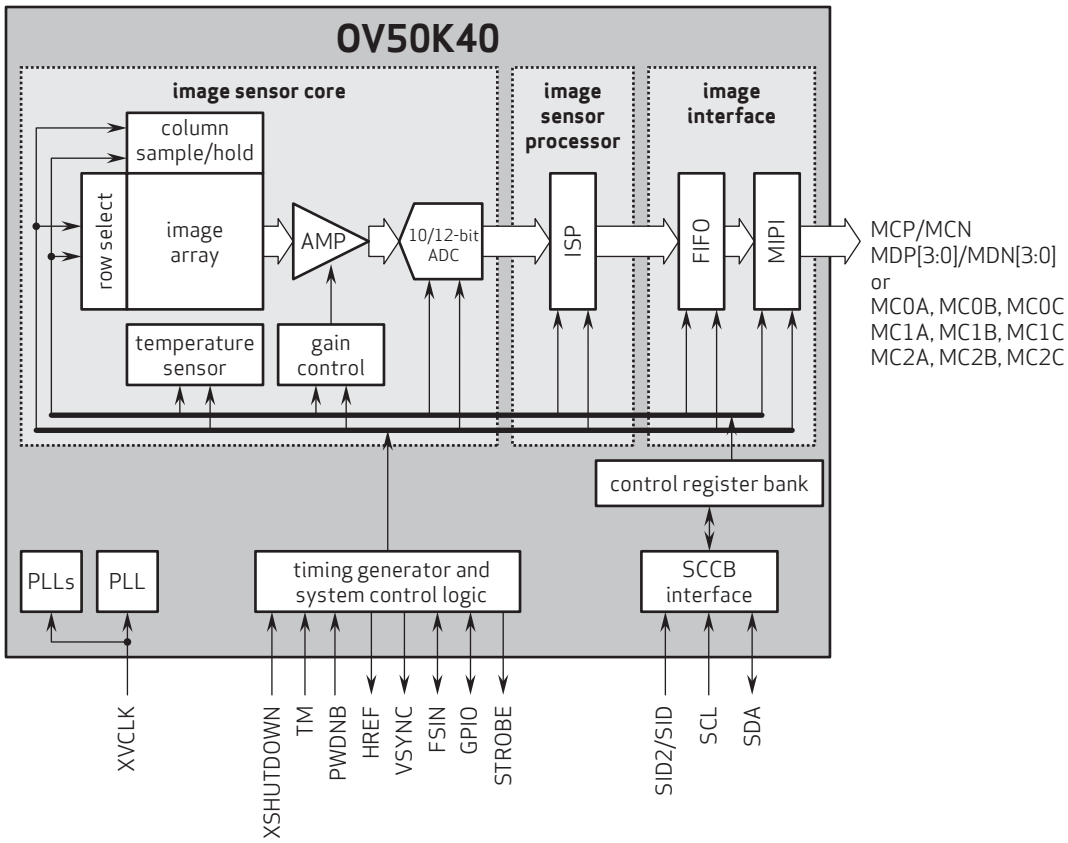
Technical Specifications

- **active array size:** 8192 x 6144
- **maximum image transfer rate:**
  - 8192 x 6144: 30 fps
  - 12.5MP (4096 x 3072) with LOFIC: 60 fps
  - 12.5MP (4096 x 3072) linear: 120 fps
- **power supply:**
  - core: 0.94V
  - analog: 2.8V and 1.8V
  - I/O: 1.8V or 1.2V
- **power requirements:**
  - active: 1050 mW (50MP @ 30 fps)
  - XSHUTDOWN: <20 µA
- **temperature range:**
  - operating: -30°C to +85°C junction temperature
  - stable: 0°C to +60°C junction temperature
- **output formats:** 10/12-bit RGB RAW
- **lens size:** 1/1.3"
- **lens chief ray angle:** 36.9° non-linear
- **scan mode:** progressive
- **pixel size:** 1.20 µm x 1.20 µm
- **image area:** 9868.8 µm x 7411.2 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:
  - 10/12-bit RGB RAW
  - 12/14-bit RGB RAW after 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
- 4-lane D-PHY MIPI TX interface, up to 3.0 Gbps/lane
- 2/3 trio C-PHY interface, up to 4.0 Gsps/trio
- high gain mode support, up to 63.75x
- supports type 2 QPD PDAF
- HDR support:
  - HCG and LOFIC RAW
  - DAG RAW or combined RAW
  - HCG + LOFIC + VS RAW or DAG + VS RAW
  - stagger HDR 2/3 exposure timing
- on-chip QPD to Bayer converter
- three on-chip phase lock loops (PLLs)
- programmable I/O drive capability
- dual I/O power supply (1.2V/1.8V)
- built-in temperature sensor
- 1.2 µm pixel

Functional Block Diagram



Version 1.0, March 2024

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