OV50X50

50-Megapixel Product Brief

Ultra High Dynamic Range 1-inch Image Sensor for Movie-Grade Video Capture in Flagship Smartphones

The OV50X50 CMOS image sensor is a 50-megapixel (MP) sensor with a 1.6-micron (µm) pixel in a 1-inch optical format designed for flagship smartphones that require high dynamic range (HDR) video and preview with single exposure, excellent low-light performance, fast autofocus and high frame rates.

The OV50X50 supports 4-cell binning for 12.5MP at 180 frames per second (fps) and 60 fps with three-channel HDR. It offers premium-quality 8K video with dual analog gain (DAG) HDR and on-sensor crop zoom.

OMNIVISION's TheiaCel™ technology further expands single exposure HDR close to 110 dB—the highest range possible in smartphones. The sensor also supports quad phase detection (QPD) for best-in-class autofocus performance. The OV50X50 is built on OMNIVISION's PureCel®Plus-S stacked-die technology, enabling high resolution with 1.6 µm pixels.

The OV50X50 is sampling now and will be in mass production in Q3 2025.

Applications

- Smartphones
- Video conferencing

Features

- **Active array size:** 8192 x 6144
- **Maximum image transfer rate:**
  - 50MP (8192 x 6144): 30 fps
  - 12.5MP (4096 x 3072) linear: 180 fps
  - 12.5MP (4096 x 3072) DCG + LOFIC: 60 fps
  - 12.5MP (4096 x 3072) HCG + LOFIC/LCG: 90 fps
- **Power supply:**
  - Analog: 2.8V and 1.8V
  - Digital: 0.9V
  - I/O: 1.2V / 1.8V
- **Output interfaces:** Up to 4-lane MIPI
- **Output formats:** 10/12/14-bit RGB RAW
- **Lens size:** 1"
- **Pixel size:** 1.6 µm x 1.6 µm

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