



OV50M

50-megapixel product brief



Low-Power, High-Performance 50MP Image Sensor for Multiple Smartphone Cameras

The OV50M40 is a versatile 0.61-micron (μm) pixel CMOS image sensor with 50-megapixel (MP) output, and features functions such as staggered high dynamic range (HDR), dual analog gain (DAG) HDR, and always-on for front, main, ultra-wide and telephoto cameras in smartphones.

It supports always-on function for motion detection and ultra-low power. The OV50M40 can consistently capture high-quality images and it enables 2x or 3x high-quality crop-zoom for telephoto camera with fast mode switch.

The OV50M40 is built on OMNIVISION's PureCel® Plus-S stacked-die technology, enabling high-resolution 50MP with small 0.61 μm pixels. The sensor's 12.5MP preview and still capture with 4-cell binning achieves 4x sensitivity ($\sim 1.22 \mu\text{m}$ equivalent pixel performance). It supports 50MP with PDAF autofocus at 12 fps, 12.5MP with PDAF autofocus at 60 fps, 4K2K video with PDAF autofocus at 60 fps, and 1080p at 120 fps.

The OV50M40 comes in a 1/2.88-inch optical format and supports the CPHY/DPHY MIPI interface and dual DOVDD 1.8/1.2V.

Find out more at www.ovt.com.



- OV50M40-GA5A-002A-Z (color, chip probing, 150 µm backgrinding, reconstructed wafer with good die)

Applications

- smart phones
- video conferencing
- PC multimedia

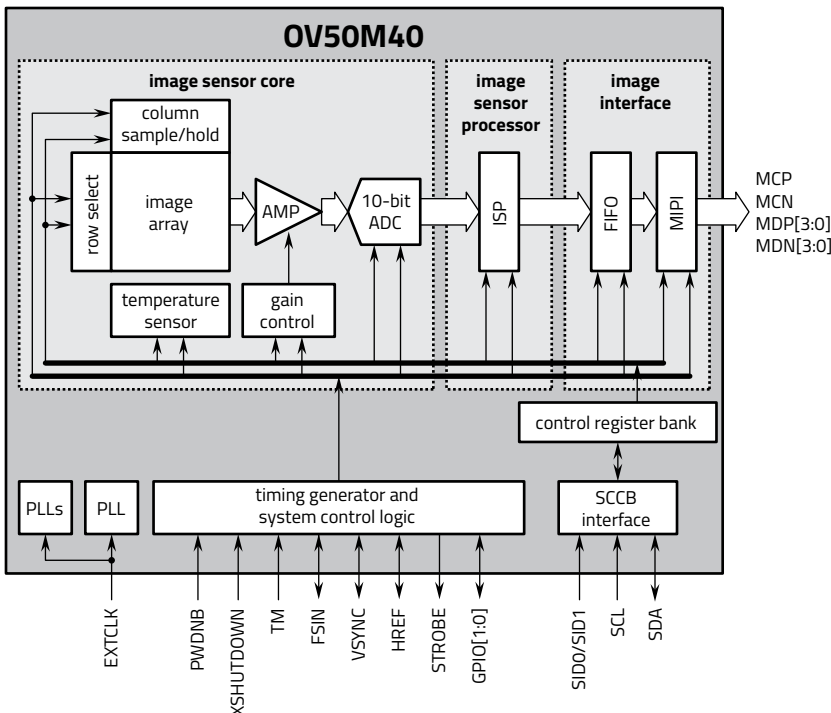
Technical Specifications

- active array size:** 8192 x 6144
- maximum image transfer rate:**
 - 8192 x 6144: 12 fps
 - 4096 x 3072: 60 fps
- power supply:**
 - core: 1.1V
 - analog: 2.8V
 - I/O: 1.8V or 1.2V
- power requirements:**
 - active: 346 mW (8192 x 6144 @ 12 fps)
 - active: 366 mW (4096 x 3072 DAG combined 12-bit)
 - standby: <30 µA
- maximum lens size:** 1/2.88"
- temperature range:**
 - operating: -30°C to +85°C junction temperature
 - stable: 0°C to +60°C junction temperature
- output formats:**
 - 10-bit RGB RAW for normal mode
 - 12/14-bit for HDR combination mode
 - 8-bit RGB RAW for ULP mode
- lens chief ray angle:** 35.22° non-linear
- scan mode:** progressive
- pixel size:** 0.612 µm x 0.612 µm
- image area:** 5023.296 µm x 3769.92 µm

Product Features

- automatic black level (ABLC)
- programmable controls for:
 - frame rate
 - mirror and flip
 - binning
 - cropping
 - windowing
- support for dynamic DPC
- supports output formats:
 - 10-bit RGB RAW for normal linear mode
 - 12/14-bit RGB RAW for DAG HDR combination mode
 - 8-bit RGB RAW for ULP and ALS mode
- supports horizontal and vertical subsampling
- supports ambient light sensor (ALS) mode
- supports ultra low power (ULP) mode
- up to 4-lane MIPI D-PHY interface with speeds up to 3.0 Gbps/lane
- 2/3 trio C-PHY interface, up to 2.4 Gbps/trio
- high gain mode support, up to 63.75x
- supports typical image sizes:
 - 8196 x 6144
 - 4096 x 3072
 - 1920 x 1080
 - 1280 x 720 and more for normal mode
 - 1024 x 768 and 512 x 384 for ULP mode
- supports 2x2 ML PD
- standard serial SCCB interface
- supports I3C control interface up to 12.5 MHz
- supports always-on (AO)
- 4-cell support:
 - 4-cell binning
 - 4-cell full (no on-chip re-mosaic)
- HDR support:
 - stagger HDR 2 exposure timing
 - DAG readout and on-chip DAG combination
- 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
- 0.612 µm pixel

Functional Block Diagram



Version 1.0, August 2024

