20-Megapixel Second-Generation 1.0-Micron PureCel®Plus-S Sensor for Front-Facing Cameras

OmniVision’s OV20880-4C is an ultra-compact image sensor engineered to bring 20-megapixel resolution to produce “super selfies” for high-end mobile applications using OmniVision’s second-generation, 1.0-micron PureCel®Plus-S pixel technology. The OV20880-4C’s on-chip pixel binning feature allows four times more light photons than a regular 1.0-micron pixel, enabling high-sensitivity and clear images in all lighting environments. The OV20880-4C pairs with OmniVision’s complete software solution for resolution recovery and high-resolution, 20-megapixel selfies combined with a 4-cell mode.

The OV20880-4C offers a full 20-megapixel 4-cell RAW output mode and a 5-megapixel Bayer output mode that uses in-pixel binning to achieve 2.0-micron pixel performance. The OV20880-4C captures full-resolution 20-megapixel images and video at 30 frames per second (fps) and 1080p full high definition (HD) video at 120 fps. The OV20880-4C offers both MIPI D-PHY and C-PHY interfaces.

The OV20880-4C can fit in a package size of 8.5 x 8.5 mm with a z-height of 5.0 mm.

Find out more at www.ovt.com.
Applications
- Smartphones
- PC Multimedia
- Video Conferencing

Product Features
- automatic black level calibration (ABLC)
- programmable controls for:
  - frame rate
  - mirror and flip
  - cropping
  - windowing
- support for dynamic DPC
- supports output formats:
  - 10-bit RAW RGB
  - DPCM 10-8 compression
- supports horizontal and vertical subsampling
- 20-megapixel resolution, 5184 x 3888, 4-cell color filter, 30 fps
- 5-megapixel resolution, 2592 x 1944, output Bayer pattern after quadra binned, 120 fps
- two on-chip phase lock loops (PLLs)
- standard serial SCCB interface with speed up to 1 MHz (when clock input is 10 MHz)
- up to 4-lane MIPI TX interface with speed up to 1.92 Gbps/lane
- programmable I/O drive capability
- embedded 20 kbits of one-time programmable (OTP) memory with 12 kbits reserved for customer use
- gyro interface with 4-wire SPI and EIS support
- long exposure time of up to 30 seconds
- built-in temperature sensor
- typical module size: 8.5 x 8.5 x 5.3 mm
- DPCM 10-8 compression supports output formats:
  - 10-bit RGB RAW
  - mirror and flip
  - frame rate
  - programmable controls for:
    - automatic black level calibration (ABLC)
    - cropping
    - mirror and flip
    - frame rate
- supports output formats:
  - 10-bit RAW RGB
  - DPCM 10-8 compression
- supports horizontal and vertical subsampling
- 15-megapixel resolution, 2592 x 1944, 4-cell color filter, 30 fps
- 5-megapixel resolution, 2592 x 1944, output Bayer pattern after quadra binned, 120 fps
- programmable I/O drive capability
- standard serial SCCB interface with speed up to 1 MHz (when clock input is 10 MHz)
- up to 4-lane MIPI TX interface with speed up to 1.92 Gbps/lane
- programmable I/O drive capability
- embedded 20 kbits of one-time programmable (OTP) memory with 12 kbits reserved for customer use
- gyro interface with 4-wire SPI and EIS support
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- typical module size: 8.5 x 8.5 x 5.3 mm
- DPCM 10-8 compression

Applications
- Video Conferencing
- Digital Camera
- Industrial

Ordering Information
- OV20880-GA5A-4C (color, chip probing, 150 µm backgrind, reconstructed wafer with good die)
- OV20880-4C

Product Specifications
- active array size: 5184 x 3888
- power supply:
  - core: 1.05V
  - analog: 2.6V
  - I/O: 1.8V
- power requirements:
  - active: 349 mW
  - standby: 10 mW
  - XSHUTDOWN: 5 µA
- temperature range:
  - operating: 0°C to +60°C junction temperature
  - stable image: 0°C to +60°C junction temperature
- output formats: 10-bit RGB RAW, DPCM 10-8 compression
- lens chief ray angle: 36.46° non-linear
- lens size: 1/2.76"
- image sensor core
- temperature sensor
- column sample/hold
- raw select
- image array
- gain control
- ADC
- 10-bit ADC
- AMP
- image sensor processor
- ISP
- image interface
- FIFO
- MIPI
- MCP/N
  - MDP/N[3:0]
- control register bank
- PLLs
- PLL
- timing generator and system control logic
- SCCB interface
- gyro interface with 4-wire SPI master
- XVCCLK
- XHZHUTDOWN
- TM
- PWNDN
- HREF
- VSYNC/FSN
- GP0/GP1/GP2/GP3
- STRB[0]/STRB[1]/STRB[2]
- SID
- SCL
- SDA
- MISO
- MOSI
- SCK
- CSB
- maximum image transfer rate:
  - 5184 x 3888: 30 fps
  - 2592 x 1944: 120 fps
  - 1920 x 1080: 180 fps
  - 1280 x 720: 180 fps
- sensitivity: 14,200 e-/lux-sec @ 530 nm in 4C bin mode
- max S/N ratio: 37.8 dB
- dynamic range: 64.8 dB @ 1x gain
- pixel size: 1.0 µm x 1.0 µm
- dark current: 4 e-/sec @ 60°C junction temperature
- image area: 5257.73 µm x 3951.36 µm
- die dimensions:
  - COB: 6210 µm x 4446 µm
  - RW: 6260 µm x 4516 µm
- input clock frequency: 6 - 64 MHz