



IMT-1B12E004-N

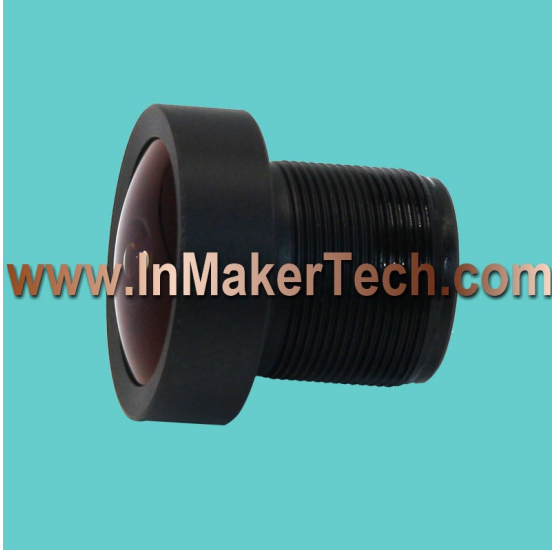
1/3" 5MP CSP F2.5 DFOV 170 Degree M12 Lens



Lens Model	IMT-1B12E004-N
Sensor Format	1/3"
Resolution	5 MP
Sensor Type	CSP
Structure	5G + IR Filter
Max Image Circle	Ø6.4
F/NO.	2.5 +/- 5%
EFL (mm)	2.30
TTL (mm)	20.10
FOV	Field of View
Diagonal DFOV	170°
Horizontal HFOV	130°
Vertical VFOV	84°
TV Distortion	<35%
CRA	<14°
Lens Filter	650nm +/- 10nm @50%
Barrel	M12*P0.5
KLT Camera Modules	KLT-KX2-OV13850 V1.0
Use IMT Made Lenses	KLT-KX5-IMX135 V1.0

IMT-1B12E004-N

1/3" 5MP CSP F2.5 DFOV 170 Degree M12 Lens



IMT Lens on
the real
Camera



KLT is our
Camera
Modules
Design and
Manufacture
Partner

www.KaiLapTech.com

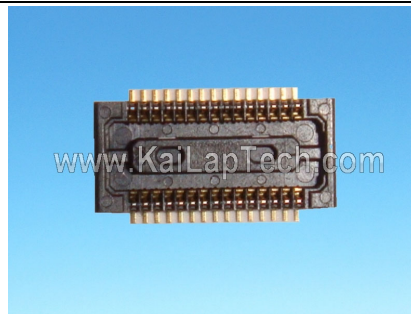
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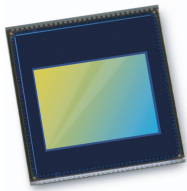
KLT-KX2-OV13850 V1.0**OmniVision OV13850 MIPI Interface Fixed Focus 13MP Camera Module**

Camera Module No.	KLT-KX2-OV13850 V1.0
Image Sensor	OV13850
EFL	2.3 mm
F.NO	2.5
Pixel	4224 x 3136
View Angle	170°
Lens Type	1/3.06 inch
Lens Dimensions	13.70 x 13.70 x 20.92 mm
Module Size	40.05 x 18.00 mm
Module Type	Fixed Focus
Interface	MIPI
IMT Lens Model	IMT-1B12E004-N

Mating Connector Part No. DF30FC-30DS-0.4V



Mating Connector On Main Board. Sold Separately.



OV13850 13MP product brief



Power-Efficient 13-Megapixel Image Sensor with Best-In-Class Performance for High-End Smartphones and Tablets



available in a lead-free package

The OV13850 is a high performance PureCel™ 13-megapixel CameraChip™ sensor that delivers best-in-class high- and low-light performance, as well as dramatically reduced power consumption for smartphones and tablets.

The OV13850 sensor offers a number of performance enhancements, including improved full-well capacity (FWC) and sensitivity for industry-leading high- and low-light performance. It also offers a 40 percent reduction in power consumption compared to our previous generation sensor, making the OV13850 ideally suited for feature-rich mobile devices.

The 1/3.06-inch OV13850 supports an active array of 4224 x 3136 pixels (13.2-megapixels) operating at 30 frames per second (fps) for zero shutter lag and can seamlessly transition between recording video and capturing still images. Additionally, the sensor supports 4K2K ultra-high definition video at 30 fps with full-horizontal field of view (FOV) and electronic image stabilization (EIS), as well as high frame rate 1080p HD video at 60 fps with EIS to enable high quality videos.

The OV13850 fits into an industry standard 8.5 x 8.5 x 5 mm module.

Find out more at www.ovt.com.

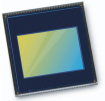
Applications

- Cellular Phones
- Tablets
- PC Multimedia

Product Features

- PureCel™ image sensor
- 1.12 μm x 1.12 μm pixel
- optical size of 1/3.06"
- 31.2° CRA for ± 6 mm z-height
- programmable controls for frame rate, mirror and flip, cropping, and windowing
- support for image sizes: 13.2MP (4224x3136), 10MP (16:9 - 4224x2376), 4K2K (3840x2160), EIS 1080p (2112x1188), EIS 720p (1408x792), and more
- 13.2MP at 30 fps
- two-wire serial bus control (SCCB)
- strobe output to control flash
- 8 kbits of embedded one-time programmable (OTP) memory
- two on-chip phase lock loops (PLLs)
- programmable controls: gain, exposure, frame rate, image size, horizontal mirror, vertical flip, cropping, and panning
- image quality controls: defect pixel correction, automatic black level calibration, lens shading correction, and alternate row HDR
- built-in temperature sensor
- suitable for module size of 8.5 x 8.5 x ± 6 mm

OV13850



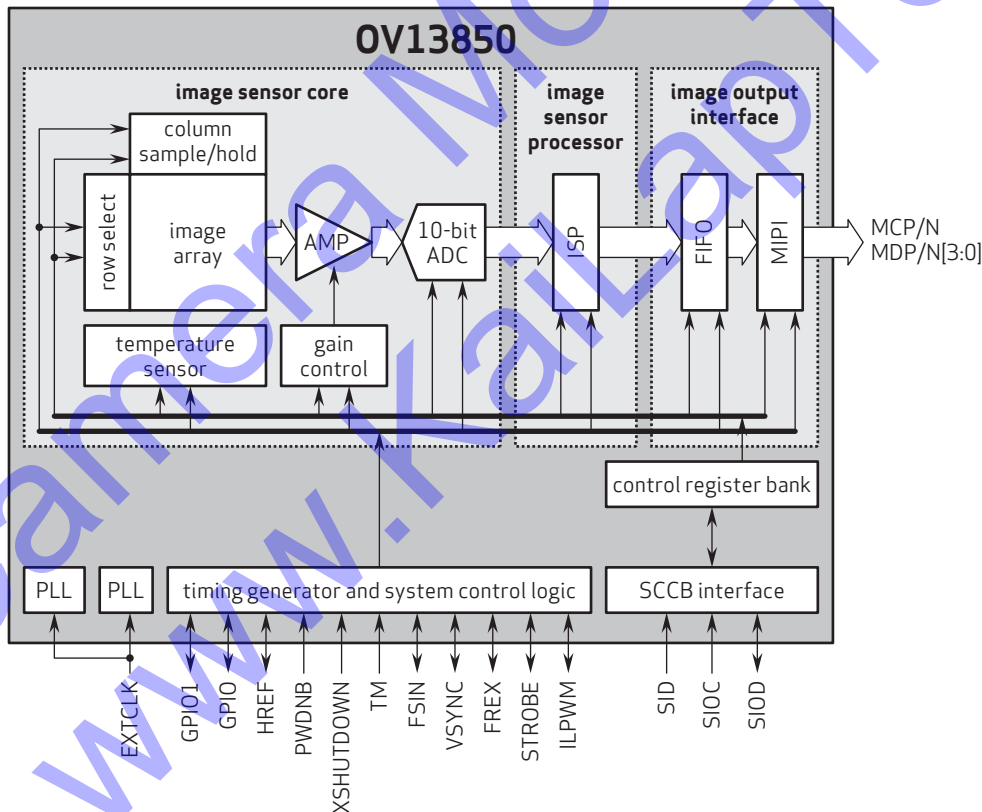
Ordering Information

- OV13850-G04A**
(color, chip probing, 200 μm backgrinding, reconstructed wafer with good die)

Product Specifications

- active array size:** 4224 x 3136
- power supply:**
 - core: 1.14 - 1.26V (1.2V nominal)
 - analog: 2.6 - 3.0V (2.8V nominal)
 - I/O: 1.7 - 3.0V (1.8V or 2.8V nominal)
- power requirements:**
 - active: 223 mW
 - standby: 300 μW
 - XSHUTDOWN: 1 μW
- temperature range:**
 - operating: -30°C to +85°C junction temperature
 - stable image: 0°C to +60°C junction temperature
- output interfaces:** up to 4-lane MIPI serial output
- output formats:** 10-bit RGB RAW
- lens size:** 1/3.06"
- lens chief ray angle:** 31.2°
- input clock frequency:** 6 - 64 MHz
- maximum image transfer rate:** 30 fps
- scan mode:** progressive
- pixel size:** 1.12 μm x 1.12 μm
- image area:** 4815 μm x 3678.3 μm
- die dimensions:** 6210 μm x 5517 μm

Functional Block Diagram



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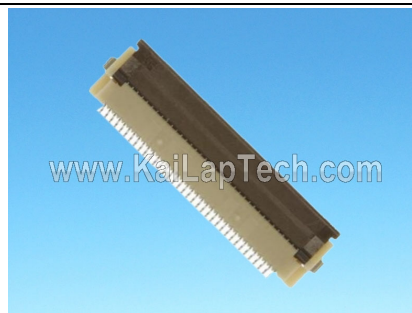
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OmniVision

KLT-KX5-IMX135 V1.0**SONY IMX135 MIPI Interface Fixed Focus 13MP Camera Module**

Camera Module No.	KLT-KX5-IMX135 V1.0
Image Sensor	IMX135
EFL	2.3 mm
F.NO	2.5
Pixel	4224 x 3136
View Angle	140°
Lens Type	1/3.06 inch
Lens Dimensions	13.7 x 13.7 x 20.92 mm
Module Size	60 x 18.0 mm
Module Type	Fixed Focus
Interface	MIPI
IMT Lens Model	IMT-1B12E004-N

Mating Connector Part No. FH12-30S-0.5SH



Mating Connector On Main Board. Sold Separately.

[Product Brief]

IMX135

Ver.1.0

Diagonal 5.867 mm (Type 1/3.06) 13M Pixel CMOS Image Sensor with Square Pixel for Color Cameras

Description

IMX135 is a diagonal 5.867 mm (Type 1/3.06) 13M pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Exmor RS™ technology to achieve high speed image capturing by column parallel A/D converter circuits and high sensitivity and low noise image (comparing with conventional CMOS image sensor) through the backside illuminated imaging pixel structure. R, G, and B pigment primary color mosaic filter is employed. High sensitivity, low dark current and smear-free features are achieved. It equips an electronic shutter with variable integration time. It operates with three power supply voltages: analog 2.7 V, digital 1.05 V and 1.8 V for input/output interface and achieves low power consumption (comparing with CCD sensors).

In addition, this product is designed for use in cellular phone and Tablet PCs. When using this for another application, Sony does not guarantee the quality and reliability of product. Therefore, don't use this for applications other than cellular phone and Tablet PCs. Consult your Sony sales representative if you have any questions.

Functions and Features

- ◆ Back-illuminated and stacked type CMOS image sensor Exmor RS
- ◆ 2-wire serial communication circuit on chip
- ◆ CSI-2 serial data output (2Lane/4Lane selectable) on chip
- ◆ Timing generator, horizontal (H) and vertical (V) driver circuits on chip
- ◆ CDS/PGA on chip
- ◆ 10-bit A/D converter on chip
- ◆ Automatic optical black (OB) clamp circuit on chip
- ◆ High sensitivity, low dark current, no smear, excellent anti-blooming characteristics
- ◆ Variable-speed shutter function (Minimum unit: One horizontal sync signal period)
- ◆ R, G, B primary color pigment mosaic filters on chip
- ◆ Supports external mechanical shutter
- ◆ Flash control pulse generation function
- ◆ Max. 24 frame/s in all-pixel scan mode
- ◆ Pixel rate: 360 MHz (all pixels, 4Lane, 24 frame/s)
- ◆ Supports 720/60 p, 1080/30 p, 1080/60 p drive *NOTE
- ◆ Up/down and/or right/left inversed readout function
- ◆ Pixel binning readout function
- ◆ Image cutout function
- ◆ OTP ROM (One Time Programmable Read Only Memory) 8 K-bit for user, 10 K-bit as a whole
- ◆ Power-on reset function
- ◆ Image compensation processing functions (defect correction, noise reduction)
- ◆ High Dynamic Range (HDR) and tone reproduction in movie mode

NOTE) Please ask about the details of a required register.

Device Structure

- ◆ CMOS image sensor
- ◆ Image size : Diagonal 5.867 mm (Type 1/3.06)
- ◆ Total number of pixels : 4224 (H) × 3176 (V) approx. 13.42 M pixels
- ◆ Number of effective pixels : 4224 (H) × 3136 (V) approx. 13.25 M pixels
- ◆ Number of active pixels : 4208 (H) × 3120 (V) approx. 13.13 M pixels
- ◆ Chip size : 5.940 mm (H) × 4.280 mm (V)
- ◆ Unit cell size : 1.12 μm (H) × 1.12 μm (V)
- ◆ Substrate material : Silicon

Functional Description

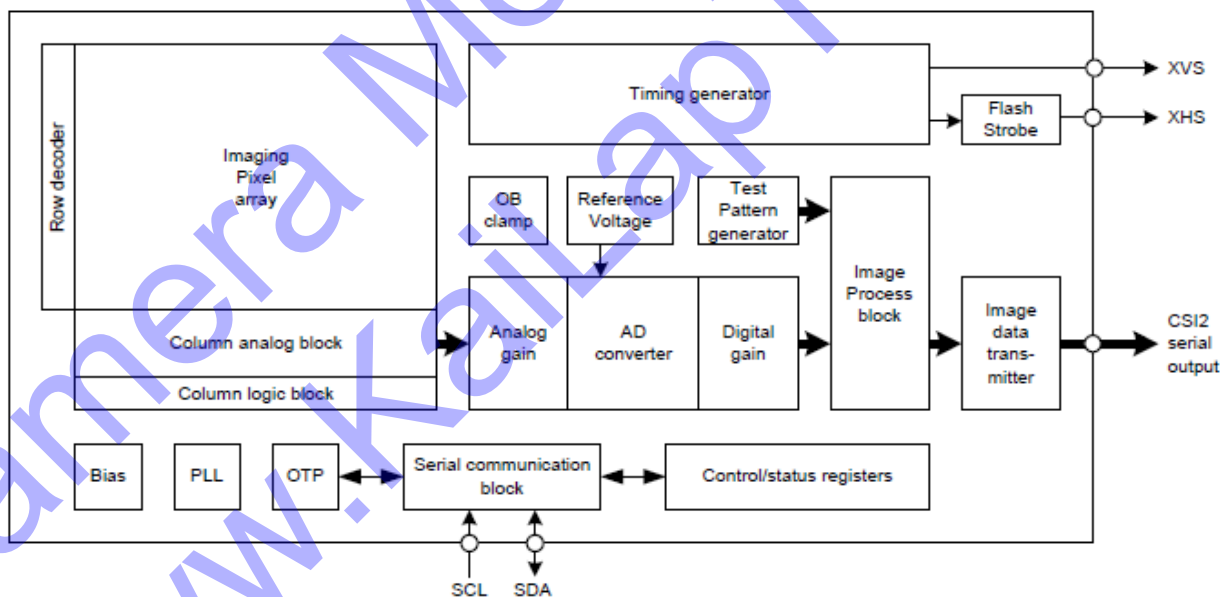
System Outline

IMX135 is a CMOS active pixel type image sensor which adopts the Exmor RS™ technology to achieve high sensitivity, low noise, and high speed image capturing. It is embedded with backside illuminated imaging pixel, low noise analog amplifier, column parallel A/D converters which enables high speed capturing, digital amplifier, image binning circuit, timing control circuit for imaging size and frame rate, CSI2 image data high speed serial interface, PLL oscillator, and serial communication interface to control these functions.

Several additional image processing functions and peripheral circuits are also included for easy system optimization by the users.

A onetime programmable memory is embedded in the chip for storing the user data. It has 8 K-bit for users, 10 K-bit as a whole.

Overview of functional block diagram



Exmor RS

* Exmor RS is a trademark of Sony Corporation. The Exmor RS is a Sony's CMOS image sensor with high-resolution, high-performance and compact size by replacing a supporting substrate in Exmor R™ which changed fundamental structure of Exmor™ pixel adopted column parallel A/D converter to back-illuminated type, with layered chips formed signal processing circuits.

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Application circuits shown, if any, are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits.