

KAE-02150

Product Preview Image Sensor

The KAE-02150 Image Sensor is a 1080p (1920 x 1080) CCD in a 2/3" optical format that provides exceptional imaging performance in extreme low light applications. Each of the sensor's four outputs incorporate both a conventional horizontal CCD register and a high gain EMCCD register.

An intra-scene switchable gain feature samples each charge packet on a pixel-by-pixel basis. This enables the camera system to determine whether the charge will be routed through the normal gain output or the EMCCD output based on a user selectable threshold. This feature enables imaging in extreme low light, even when bright objects are within a dark scene, allowing a single camera to capture quality images from sunlight to starlight.

This image sensor is based on the TRUESENSE 5.5-micron Interline Transfer CCD Platform, and features extended dynamic range, excellent imaging performance, and a flexible readout architecture that enables use of 1, 2, or 4 outputs. A vertical overflow drain structure suppresses image blooming, provides excellent MTF, and enables electronic shuttering for precise exposure control.

Parameter	Typical Value
Architecture	Interline CCD; with EMCCD
Total Number of Pixels	2004 (H) x 1144 (V)
Number of Effective Pixels	1960 (H) x 1120 (V)
Number of Active Pixels	1920 (H) x 1080 (V)
Pixel Size	5.5 μm (H) x 5.5 μm (V)
Active Image Size	10.56 mm (H) x 5.94 mm (V) 12.1 mm (diagonal)
Aspect Ratio	16:9
Number of Outputs	1, 2, or 4
Charge Capacity	20,000 electrons
Output Sensitivity	44 $\mu\text{V/e}$
Quantum Efficiency KAE-02150-ABA (Mono) KAE-02150-FBA (R,G,B)	50% 33%, 41%, 43%
Read Noise (20 Mhz) Normal mode (1x gain) Intra-scene mode (20x gain)	10 electrons rms < 1 electron rms
Dark Current (0°C) Photodiode VCCD	< 0.1 electrons/s 6 electrons/s
Dynamic Range Normal mode (1x gain) Intra-scene mode (20x gain)	68 dB 86 dB
Charge Transfer Efficiency	0.999999
Blooming Suppression	> 1000 X
Smear	-100 dB
Image Lag	< 1 electron
Maximum Pixel Clock Speed	40 MHz
Maximum Frame Rate Normal mode (40 MHz) Intra-scene mode (20 MHz)	60 fps 30 fps
Package	135 pin PGA
Cover Glass	Clear Glass, Taped

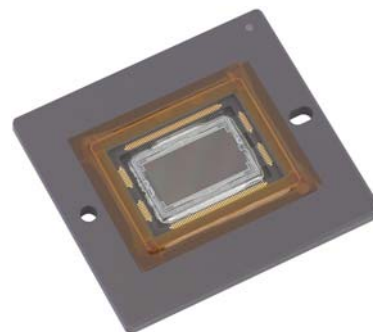
All parameters are specified at T = 0°C unless otherwise specified.

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.



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Features

- Intra-scene switchable gain
- Wide dynamic range
- Low noise architecture
- Exceptional low light imaging
- Global shutter
- Excellent image uniformity and MTF
- Bayer Color Pattern and Monochrome

Applications

- Surveillance
- Scientific Imaging
- Medical Imaging
- Intelligent Transportation

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

KAE-02150


ORDERING INFORMATION

US export controls apply to all shipments of this product designated for destinations outside of the US and Canada, requiring ON Semiconductor to obtain an export license from the US Department of Commerce before image sensors or evaluation kits can be exported.

Part Number	Description	Marking Code
KAE-02150-ABB-JP-FA	Monochrome, Microlens, PGA Package, Taped Clear Cover Glass, no coatings, Standard Grade	KAE-02150-ABB Serial Number
KAE-02150-ABB-JP-EE	Monochrome, Microlens, PGA Package, Taped Clear Cover Glass, no coatings, Engineering Grade	
KAE-02150-FBB-JP-FA	Color (Bayer RGB), Microlens, PGA Package, Taped Clear Cover Glass(no coatings), Standard Grade	KAE-02150-FBB Serial Number
KAE-02150-FBB-JP-EE	Color (Bayer RGB), Microlens, PGA Package, Taped Clear Cover Glass(no coatings), Engineering Grade	

1. Standard Grade part numbers are listed for informational purposes only. Standard Grade part numbers are not available for orders at this time. Please contact ON Semiconductor for availability dates.
2. Engineering Grade part numbers are available for orders at this time.

See the ON Semiconductor *Device Nomenclature* document (TND310/D) for a full description of the naming convention used for image sensors. For reference documentation, including information on evaluation kits, please visit our web site at www.onsemi.com.

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