Kodak
Image Sensor Solutions

## PRODUCT SUMMARY

# KODAK KAI-04050 IMAGE SENSOR

## 2336 (H) X 1752 (V) PROGRESSIVE SCAN INTERLINE CCD IMAGE SENSOR

### DESCRIPTION

The KODAK KAI-04050 Image Sensor is a 4-megapixel CCD in a 1" (16 mm diagonal) optical format. Based on the KODAK TRUESENSE 5.5 micron Interline Transfer CCD Platform, the sensor features broad dynamic range, excellent imaging performance, and a flexible readout architecture that enables use of 1, 2, or 4 outputs. The sensor supports full resolution readout up to 32 frames per second, while a Region of Interest (ROI) mode enables partial readout of the sensor at even higher frame rates. A vertical overflow drain structure suppresses image blooming and enables electronic shuttering for precise exposure control. Other features include low dark current, negligible lag, and low smear.

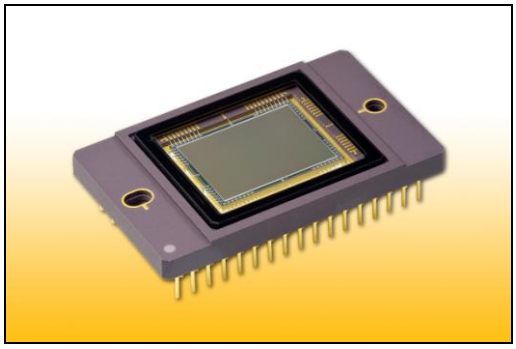
The sensor shares common pin-out and electrical configurations with other devices based on the KODAK TRUESENSE 5.5 micron Interline Transfer CCD Platform, allowing a single camera design to support multiple members of this sensor family.

### FEATURES

- Color or Monochrome configurations
- Progressive scan readout
- Flexible readout architecture
- High frame rate
- High sensitivity
- Low noise architecture
- Excellent smear performance
- Package pin reserved for device identification

### APPLICATIONS

- Industrial Imaging
- Medical Imaging
- Security



| Parameter | Typical Value |
|---|---|
| Architecture | Interline CCD; Progressive Scan |
| Total Number of Pixels | 2404 (H) x 1800 (V) |
| Number of Effective Pixels | 2360 (H) x 1776 (V) |
| Number of Active Pixels | 2336 (H) x 1752 (V) |
| Pixel Size | 5.5 µm (H) x 5.5 µm (V) |
| Active Image Size | 12.85 mm (H) x 9.64 mm (V)<br>16.06 mm (diag) 1" optical format |
| Aspect Ratio | 4:3 |
| Number of Outputs | 1, 2, or 4 |
| Charge Capacity | 20,000 electrons |
| Output Sensitivity | 34 µV/$e^-$ |
| Quantum Efficiency<br>KAI-04050-ABA<br>KAI-04050-CBA | <br>50% (500 nm)<br>31%, 42%, 43% (620, 540, and 470 nm) |
| Read Noise (f= 40MHz) | 12 electrons rms |
| Dark Current<br>Photodiode<br>VCCD | <br>7 electrons/s<br>100 electrons/s |
| Dark Current Doubling Temp<br>Photodiode<br>VCCD | <br>7 °C<br>9 °C |
| Dynamic Range | 64 dB |
| Charge Transfer Efficiency | 0.999999 |
| Blooming Suppression | > 300 X |
| Smear | -100 dB |
| Image Lag | < 10 electrons |
| Maximum Pixel Clock Speed | 40 MHz |
| Maximum Frame Rates<br>Quad Output<br>Dual Output<br>Single Output | <br>32 fps<br>16 fps<br>8 fps |
| Package | 68 pin PGA |
| Cover Glass | AR Coated, 2 Sides |

All parameters are specified at T = 40° C unless otherwise noted.

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## ORDERING INFORMATION

| Catalog Number | Product Name | Description | Marking Code |
|---|---|---|---|
| 4H2085 | KAI-04050-AAA-JR-BA | Monochrome, No Microlens, PGA Package, Taped Clear Cover Glass with AR coating (both sides), Standard Grade | KAI-04050-AAA Serial Number |
| 4H2086 | KAI-04050-AAA-JR-AE | Monochrome, No Microlens, PGA Package, Taped Clear Cover Glass with AR coating (both sides), Engineering Grade | |
| 4H2087 | KAI-04050-ABA-JD-BA | Monochrome, Telecentric Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Standard Grade | KAI-04050-ABA Serial Number |
| 4H2088 | KAI-04050-ABA-JD-AE | Monochrome, Telecentric Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Engineering Grade | |
| 4H2089 | KAI-04050-ABA-JR-BA | Monochrome, Telecentric Microlens, PGA Package, Taped Clear Cover Glass with AR coating (both sides), Standard Grade | |
| 4H2090 | KAI-04050-ABA-JR-AE | Monochrome, Telecentric Microlens, PGA Package, Taped Clear Cover Glass with AR coating (both sides), Engineering Grade | |
| 4H2091 | KAI-04050-CBA-JD-BA | Color (Bayer RGB), Telecentric Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Standard Grade | KAI-04050-CBA Serial Number |
| 4H2092 | KAI-04050-CBA-JD-AE | Color (Bayer RGB), Telecentric Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Engineering Grade | |

See ISS Application Note "Product Naming Convention" (MTD/PS-0892) for a full description of naming convention used for KODAK image sensors.

For all reference documentation, please visit our Web Site at www.kodak.com/go/imagers.

Please address all inquiries and purchase orders to:

Image Sensor Solutions
Eastman Kodak Company
Rochester, New York 14650-2010

Phone: (585) 722-4385
Fax: (585) 477-4947
E-mail: imagers@kodak.com

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