

## Datasheet **Iron2011E CoF**

### **Iron2011E CoF**

2.4 Megapixel, Small, Rugged,  
Low Power with Large Feature Set

#### **Innovative Approach**

**Iron2011E CoF** is an ultra-thin high speed, low-cost, low-power Global shutter CMOS camera with a SFP+ interface which supports 2.4 Megapixel high quality video at rates up to 290.0 fps.

#### **Intelligent Design**

With an extremely compact form factor, the **Iron2011E CoF** fits into small spaces. The superior sensor performance provides high quality images with great dynamic range, low noise and excellent low-light vision capabilities.

#### **Key Features:**

- 2.4 Megapixel up to 290.0 fps
- Monochrome sensor variation
- Up to 4 W power at full rate
- Full image processing feature set
- CoaXPress-over-Fiber (CoF) v2.1 standard compliant
- Gen<i>Cam compliant
- 1 CoaXPress-over-Fiber (CoF) link
- C or CS lens mounts available
- Commercial and Industrial grade options
- Full EMVA1288 report
- Full built-in self-test (BIT)
- Full built-in voltage testing
- Customization as per user requirements

#### **Applications:**

- Perimeter vision
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

# TECHNICAL DATA

| General                         |   |
|---------------------------------|---|
| Pixel Size                      | 6.5 $\mu\text{m}$ x 6.5 $\mu\text{m}$   |
| Resolution                      | 2048 (H) x 1152 (V)   |
| Sensor Size                     | 15.3 mm diagonal  |
| Sensor                          | Gpixel GSENSE2011E  |
| Sensor Type                     | CMOS  |
| Output Interface                | CoaXPress-over-Fiber (CoF) v2.1   |
| Supported Interface rates       | 10G   |
| Interface Connector             | SFP+  |
| Number of Connectors            | 1   |
| Output Resolution               | 8 or 10 bit   |
| Maximum Frame Rate              | <ul style="list-style-type: none"> <li>• 290 fps @8 bit resolution</li> <li>• 230 fps @10 bit resolution</li> </ul>   |
| Tap Geometry                    | 1X-1Y   |
| Image Acquisition               | Continuous / Triggered  |
| Camera Control                  | Gen<i>Cam   |
| Electronic Shutter              | Global  |
| Monochrome / Color              | Monochrome  |
| Temporal Noise                  | <6.2 e- at 25°C   |
| Full Well Charge                | 19000 e-  |
| Dynamic Range                   | >70 dB at 595 nm  |
| Signal-to-Noise Ratio (SNR max) | 41.5 dB at 595 nm   |
| Quantum Efficiency (QE)         | >72% at 595 nm  |
| Shortest Exposure               | 2.6 $\mu\text{s}$   |
| IR Filter (optional)            | -   |
| Exposure control                | Automatic/Manual  |
| Gain control                    | Automatic/Manual  |
| Color Control                   | <ul style="list-style-type: none"> <li>• RGB offsets</li> <li>• Auto / Manual White balance</li> <li>• LUT</li> </ul>   |
| Image enhancement               | <ul style="list-style-type: none"> <li>• Defect pixel correction</li> <li>• Gain (Analog / Digital)</li> <li>• Auto / Manual black level</li> <li>• Binning</li> <li>• Auto Exposure / Gain</li> <li>• Flat field / Fixed pattern noise correction</li> </ul> |
| Additional on camera processing | <ul style="list-style-type: none"> <li>• ROI</li> <li>• Image flip</li> <li>• Frame counter</li> <li>• Operational Time Counter</li> <li>• Binning</li> </ul>   |
| Power Input                     | <ul style="list-style-type: none"> <li>• External 11 V - 28 V input</li> </ul>  |

|                        |                               |
|------------------------|-------------------------------|
| Power Consumption      | <4 W at 24 V DC               |
| Configuration software | Gen<i>Cam Standard software   |
| Synchronization        | Protocol/External I/O Trigger |
| Exposure Strobe output | Yes                           |

## General Purpose Inputs and Outputs

|                           |   |
|---------------------------|---|
| I/O lines                 | <ul style="list-style-type: none"> <li>• 1 opto-isolated input</li> <li>• 1 opto-isolated output</li> <li>• 1 singled-ended TTL output</li> <li>• 1 singled-ended TTL/LVTTL input</li> </ul>  |
| Usage                     | <ul style="list-style-type: none"> <li>• Any System I/O input lines can be connected to any I/O output line</li> <li>• Any I/O input line can generate any trigger event</li> <li>• Any I/O input line can trigger a timer</li> <li>• Any I/O input line can trigger a counter</li> </ul> |
| Electrical specifications | <ul style="list-style-type: none"> <li>• TTL lines: 5 V TTL compliant</li> <li>• LVTTL lines: 3.3 V LVTTL compliant</li> <li>• Isolated lines: opto-isolated lines with voltage range up to 30 V</li> </ul>   |
| Timers                    | <ul style="list-style-type: none"> <li>• 4 general purpose timers</li> <li>• Configurable delay and duration</li> <li>• 32-bit accumulator</li> </ul>   |
| Counters                  | <ul style="list-style-type: none"> <li>• 4 general purpose counters</li> <li>• Configurable value and duration</li> <li>• 32-bit counter</li> </ul>   |

## Mechanical

|                                   |  |
|-----------------------------------|--|
| Dimensions (including lens mount) | 44 mm x 44 mm x 90.4 mm (1.7" x 1.7" x 3.6") |
| Weight (without lens)             | 233 g (8.2 oz)                               |
| Lens Mount                        | C or CS                                      |
| Sensor Alignment                  | Active                                       |
| Ingress Protection                | Optional IP67 (with protective lens tube)    |

## Environmental Conditions

|                                   |   |
|-----------------------------------|---|
| Operating ambient air temperature | Commercial : 0°C to +50°C ( 32°F to +122°F)<br>Industrial : -40.0°C to +80°C ( -40°F to +176°F) |
| Operating ambient air humidity    | 10% to 90% RH non-condensing  |
| Storage ambient air temperature   | Commercial : 0°C to +55°C ( 32°F to +131°F)<br>Industrial : -40.0°C to +85°C ( -40°F to +185°F) |
| Storage ambient air humidity      | 10% to 90% RH non-condensing  |
| Operational Shock                 | Tested per MIL-STD-810G Method 516.6, 3-axis Shock 75G  |
| Operational Vibration             | Tested per MIL-STD-810G Method 514.6, 3-axis Vibration Category 20                              |
| MTBF                              | 2,100,000 hrs @ 50C (Telecordia)  |

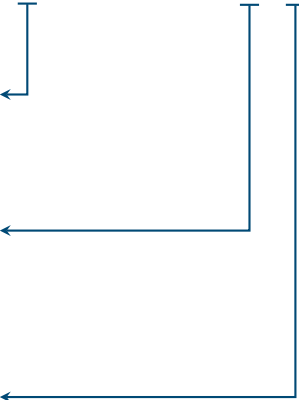
| Certifications                  |  |
|---------------------------------|--|
| Electromagnetic - EMC standards | <ul style="list-style-type: none"> <li>• The European Council EMC Directive 2004/108/EC</li> <li>• The Unites States FCC rule 47 CFR 15</li> </ul> |
| EMC - Emission                  | <ul style="list-style-type: none"> <li>• EN 55022:2010 Class B</li> <li>• FCC 47 Part 15 Class B</li> </ul>  |
| EMC - Immunity                  | <ul style="list-style-type: none"> <li>• EN 55024:2010 Class B</li> <li>• EN 61000-4-3</li> <li>• EN 61000-4-4</li> <li>• EN 61000-4-6</li> </ul>  |
| Flammability                    | PCB compliant with UL 94 V-0   |
| RoHS                            | Compliant with the European Union Directive 2011/65/EU (RoHS2)   |
| REACH                           | Compliant with the European Union Regulation No 1907/2006  |
| WEEE                            | Must be disposed of separately from normal household waste and must be recycled according to local regulations                                     |

# Iron2011EM-CoF-SC

| Color options  |
|----------------|
| M – Monochrome |

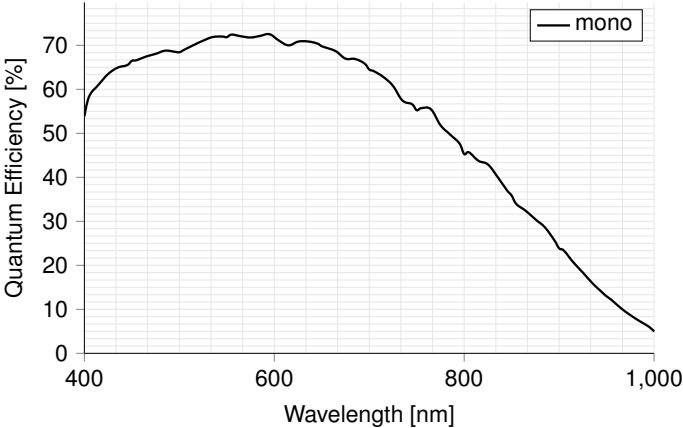
| Grade          |
|----------------|
| S – Commercial |
| R – Industrial |

| Lens mount   |
|--------------|
| C – C-Mount  |
| S – CS-Mount |



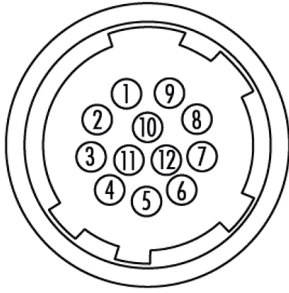
# SPECTRAL RESPONSE

## Monochrome



# GENERAL PURPOSE INPUT OUTPUT

## GPIO Pinout – 12 Pin Hirose Connector



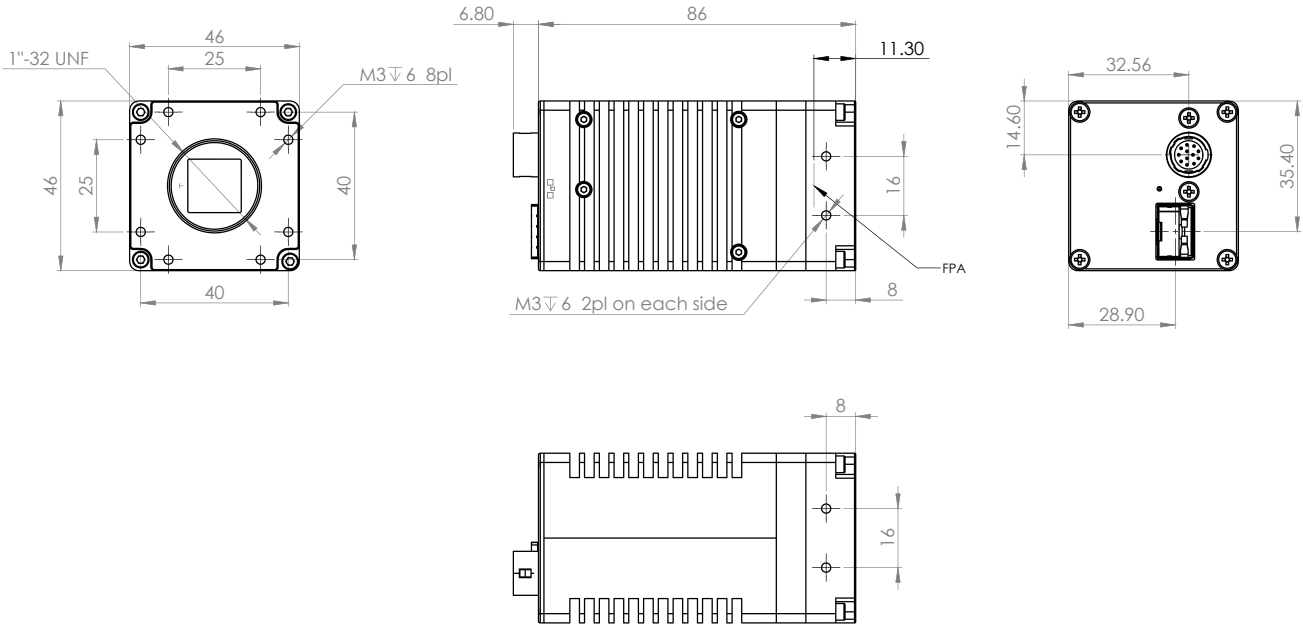
- |                    |                     |
|--------------------|---------------------|
| 1. DC Power return | 7. OUT1 (TTL)       |
| 2. DC Power        | 8. IN1 (OPTO)       |
| 3. RS232 RX        | 9. IN2 (TTL/LVTTL)  |
| 4. RS232 TX        | 10. IN1 Return      |
| 5. OUT2 Return     | 11. IN2/OUT1 Return |
| 6. RS232 Return    | 12. OUT2 (OPTO)     |

The GPIO connector used on the camera is a 12-pin male Hirose connector. It is recommended to use a cable with a matching Hirose 12 pin female connector. Hirose's manufacturer's part number is listed below:

| Product Name                 | Product Part Number |
|------------------------------|---------------------|
| Hirose 12P connector, male   | HR10A-10R-12PB      |
| Hirose 12P connector, female | HR10A-10P-12S       |

# MECHANICAL DRAWINGS

## C/CS-Mount



*Dimensions are in millimeters.*



# COMPATIBILITY

**KAYA Instruments** creates and maintains compatibility and interfaces for the most common and advanced vision image processing libraries and applications. Major support is available for **MVTec Halcon**, **National Instruments' LabVIEW** and **MathWorks' MATLAB**.

Supported vision standards:



Supported vision libraries:



Supported operating systems:



*Please check our website for an up-to-date list of other supported libraries and software package.*

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