

# Datasheet Iron253 CoF



## Iron253 CoF

**12.3 Megapixel, Global shutter, Small, Rugged, Low Power with Large Feature Set**

KAYA Vision is a global leader in commercial, industrial and rugged cameras and imaging system solutions, providing high-performance products for over 15 years. Founded in 2010 by industry experts, KAYA Vision designs, manufactures and supports both COTS and custom products for high-performance imaging needs.

KAYA Vision cameras leverage cutting-edge technology to provide exceptional image quality in the smallest form factors. Our advanced camera lineup features built-in image pre-processing, enhancement, and correction, all while maintaining industry-leading power efficiency. Designed for reliability, our SWaP-C (Size, Weight, Power, and Cost) optimized cameras offer the highest durability, operating in extreme environments with the widest temperature ranges, superior shock and vibration resistance, and extended MTBF. KAYA Vision cameras are the ultimate choice for high-performance imaging systems across commercial, industrial, medical, defense aerospace, and scientific applications.

## Key Features:

- 12.3 Megapixel up to 63.8 fps
- Monochrome and Color sensor variation
- Up to 3.2 W power at full rate
- Full image processing feature set
- CoaXPress-over-Fiber (CoF) v2.1 standard compliant
- Gen<i>i</i>Cam compliant
- 1 CoaXPress-over-Fiber (CoF) link
- C lens mount 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

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## TECHNICAL DATA

| General                         |                                                                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pixel Size                      | 4.5 $\mu\text{m}$ x 4.5 $\mu\text{m}$                                                                                                                                                                                                                  |
| Resolution                      | 4096 (H) x 3000 (V)                                                                                                                                                                                                                                    |
| Sensor Size                     | 22.8 mm diagonal                                                                                                                                                                                                                                       |
| Sensor Format                   | 1.1"                                                                                                                                                                                                                                                   |
| Sensor                          | Sony Pregius IMX253                                                                                                                                                                                                                                    |
| 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, 10 or 12 bit                                                                                                                                                                                                                                        |
| Maximum Frame Rate              | <ul style="list-style-type: none"><li>• 63.8 fps @8 bit resolution</li><li>• 63.8 fps @10 bit resolution</li><li>• 45.5 fps @12 bit resolution</li></ul>                                                                                               |
| Tap Geometry                    | 1X-1Y                                                                                                                                                                                                                                                  |
| Image Acquisition               | Continuous / Triggered                                                                                                                                                                                                                                 |
| Camera Control                  | Gen<i>Cam                                                                                                                                                                                                                                              |
| Electronic Shutter              | Global                                                                                                                                                                                                                                                 |
| Monochrome / Color              | Monochrome or Color                                                                                                                                                                                                                                    |
| Temporal Noise                  | <2.2 e- at 25°C                                                                                                                                                                                                                                        |
| Full Well Charge                | 9828 e-                                                                                                                                                                                                                                                |
| Dynamic Range                   | >70.8 dB at 520 nm                                                                                                                                                                                                                                     |
| Signal-to-Noise Ratio (SNR max) | 40 dB at 520 nm                                                                                                                                                                                                                                        |
| Quantum Efficiency (QE)         | >63% at 520 nm                                                                                                                                                                                                                                         |
| Shortest Exposure               | 10 $\mu\text{s}$                                                                                                                                                                                                                                       |
| IR Filter (optional)            | <ul style="list-style-type: none"><li>• UV cut below 400 nm</li><li>• IR cut above 700 nm</li></ul>                                                                                                                                                    |
| 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               | <3.2 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>                                                                                                                                |
| Absolute Maximum                   | <ul style="list-style-type: none"> <li>• TTL/LVTTL input voltage: -0.3 V to +6 V</li> <li>• TTL output current: 40 mA</li> <li>• Isolated input voltage: -4 V to +25 V</li> <li>• Isolated output voltage: -0.3 V to +25 V</li> <li>• Isolated input current: 30 mA</li> <li>• Isolated output current: 50 mA</li> </ul>                   |
| Operating                          | <ul style="list-style-type: none"> <li>• TTL/LVTTL input voltage: 0 V to +5 V</li> <li>• TTL output current: 0mA to 24 mA</li> <li>• Isolated input voltage: 0 V to +24 V</li> <li>• Isolated output voltage: 0 V to +24 V</li> <li>• Isolated input current: 6.3 mA to 15 mA</li> <li>• Isolated output current: 1 mA to 25 mA</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) | 45.8 mm x 45.8 mm x 86.8 mm (1.8" x 1.8" x 3.4") |
| Weight (without lens)             | 180 g (6.3 oz)                                   |
| Lens Mount                        | C                                                |
| 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 +70°C ( -40°F to +158°F)<br>At 1 m/s airflow |
| 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 +75°C ( -40°F to +167°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 EMC Directive 2014/30/EU</li> <li>• The Unites States FCC rule 47 CFR 15</li> </ul>         |
| EMC - Emission                  | <ul style="list-style-type: none"> <li>• EN 55032:2015 Class B</li> <li>• FCC 47 Part 15 Class B</li> </ul>                                       |
| EMC - Immunity                  | <ul style="list-style-type: none"> <li>• EN 55035:2017 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                                    |

# Iron253M-CoF-SC

Color options

M – Monochrome  
I – Mono with IR Filter  
N – Color w/o IR Filter  
C – Color

Grade

S – Commercial  
R – Industrial

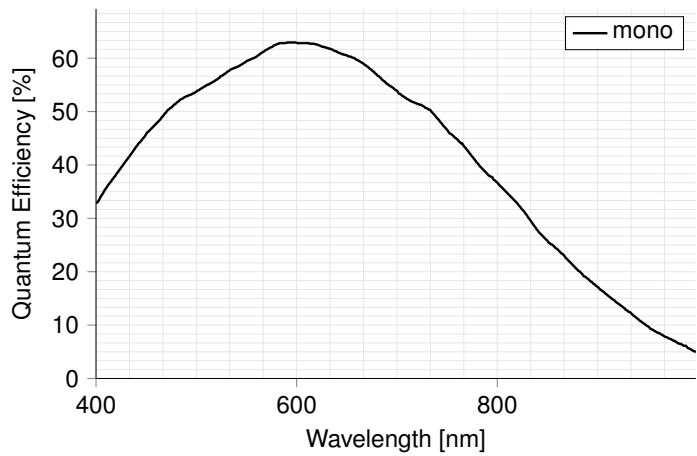
Lens mount

C – C-Mount

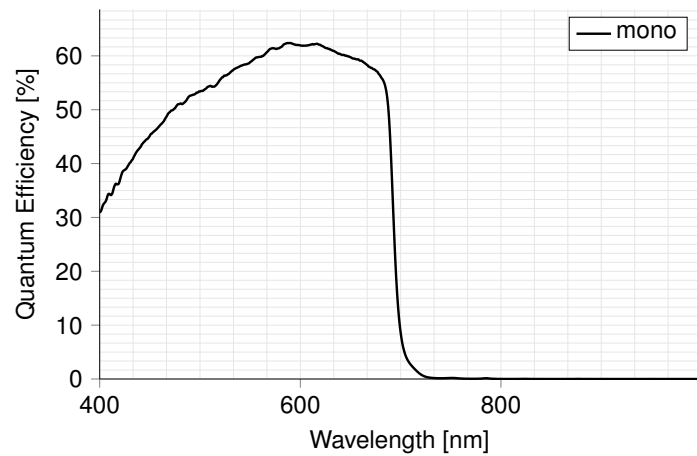
|                      |                                                                                   |
|----------------------|-----------------------------------------------------------------------------------|
| Accessories          |                                                                                   |
| Optional accessories | <ul style="list-style-type: none"><li>SFP+ modules</li><li>Fiber cables</li></ul> |
| Accessories Included | -                                                                                 |

# SPECTRAL RESPONSE

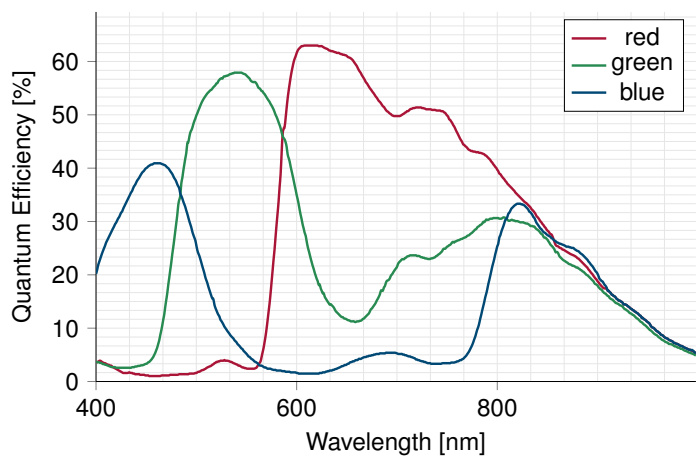
Monochrome



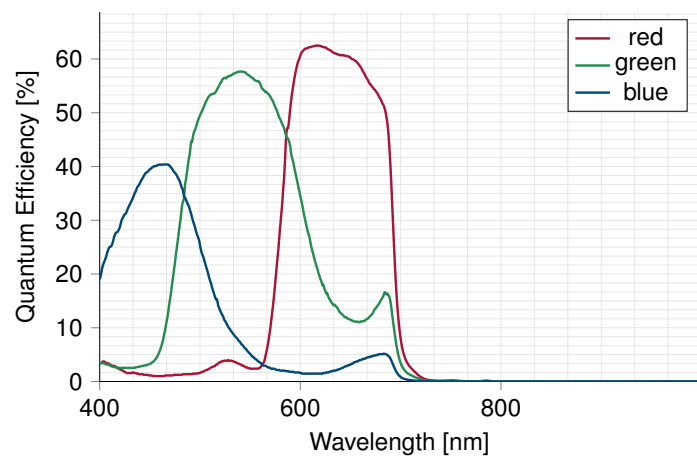
Monochrome with IR Cut Filter



Color

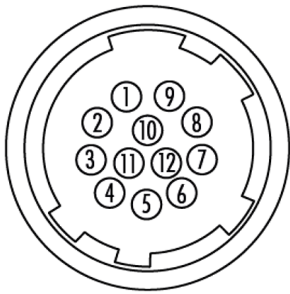


Color with IR Cut Filter



# GENERAL PURPOSE INPUT OUTPUT

## GPIO Pinout – 12 Pin Hirose Connector



1. DC Power return

2. DC Power

3. RS232 RX

4. RS232 TX

5. OUT2 Return

6. RS232 Return
7. OUT1 (TTL)

8. IN1 (OPTO)

9. IN2 (TTL/LVTTL)

10. IN1 Return

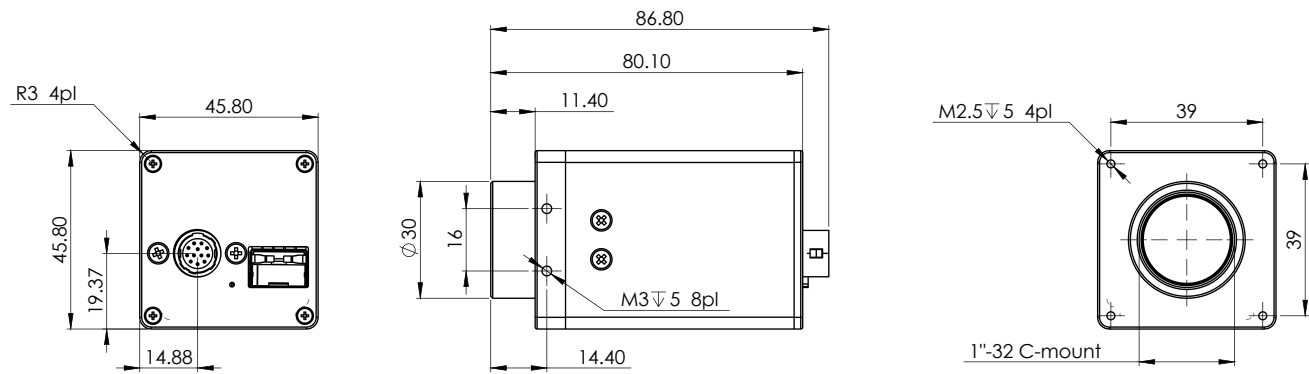
11. IN2/OUT1 Return

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       |

C-Mount



Dimensions are in millimeters.

# COMPATIBILITY

KAYA Vision develops and maintains compatibility and interfaces for the most common and advanced vision image processing libraries and applications. We ensure seamless integration with major platforms to provide users with a flexible and convenient development environment, minimize integration effort, and accelerate time to deployment.

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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内容は予告なく変更される場合があります。



Have questions about pricing, availability, documentation, or custom options?  
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