

## Chapter 4. Package Components

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### Package Components



VC-4MX-M144F

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## Chapter 5. Product Specifications

### 5.1 Overview

The VC-4MX-M144F, a very compact solution for easy system integration, is based on the CMOS global shutter imager. The VC-4MX-M144F camera features 4-megapixel resolution with frame rate up to 144 fps. This combination of global shutter, resolution and frame rate sets a new standard for industrial, scientific and surveillance digital imaging applications. Customers in the industrial market can take advantage of common coax cabling to transmit images at rates and distance above and beyond previous standards.

With this camera, image data can be transmitted at up to 6.25 Gbps using a single coaxial cable. Featuring high quality image and high speed, this camera is ideal for wide range of demanding applications including PCB and semiconductor inspections.

### Main Features

- High Speed 4 Megapixel CMOS Image Sensor
- Electronic Exposure Time Control (Global Shutter)
- Output Pixel Format: 8 bit
- Line Output
- Output Channel: CXP6 × 1ch
- Power over CoaXPress (PoCXP)
- Gain/Black Level Control
- Test Pattern
- Temperature Monitor
- Field Upgrade
- Image Correction
- Defective Pixel Correction
- VC-4MX-M144F Feature Bar



## 5.2 Specifications

The technical specifications of the VC-4MX-M144F camera are as follows:

Specifications	VC-4MX-M144F	
Active Image (H × V)	2048 × 2048	
Sensor	AMS CMOSIS CMV4000	
Pixel Size	5.5 μm × 5.5 μm	
Sensor Size (Optical Format)	11.26 mm × 11.26 mm (1")	
Interface	CoaXPress (CXP-6)	
Electronic Shutter	Global Shutter	
Max. Frame Rate	144 fps @ 6.25 Gbps	
Pixel Data Format	Mono8	
Exposure Time	1 μs ~ 60 s (1 μs step)	
Partial Scan (Max. Speed)	19607 fps at 1 Line	
Black Level Control	0 ~ 16 LSB	
Gain Control	1× ~ 4×	
Trigger Synchronization	Free-Run, Hardware Trigger or CXP	
External Trigger	3.3 V ~ 24.0 V, 10 mA, Logical Level Input, Optically Isolated	
Dynamic Range	53 dB	
Lens Mount	C-mount, Custom mount available upon request	
Power	External	10 ~ 24 VDC
	Dissipation	Typ. 3.5 W
	PoCXP	24 VDC
Environmental	Operating: -5°C ~ 40°C, Storage: -40°C ~ 70°C	
Dimension / Weight	40 mm × 40 mm × 41 mm, 200 g (with C-mount)	
API SDK	Vieworks Imaging Solution 7.X	

Table 5-1 Specifications of VC-4MX-M144F

### 5.3 Camera Block Diagram

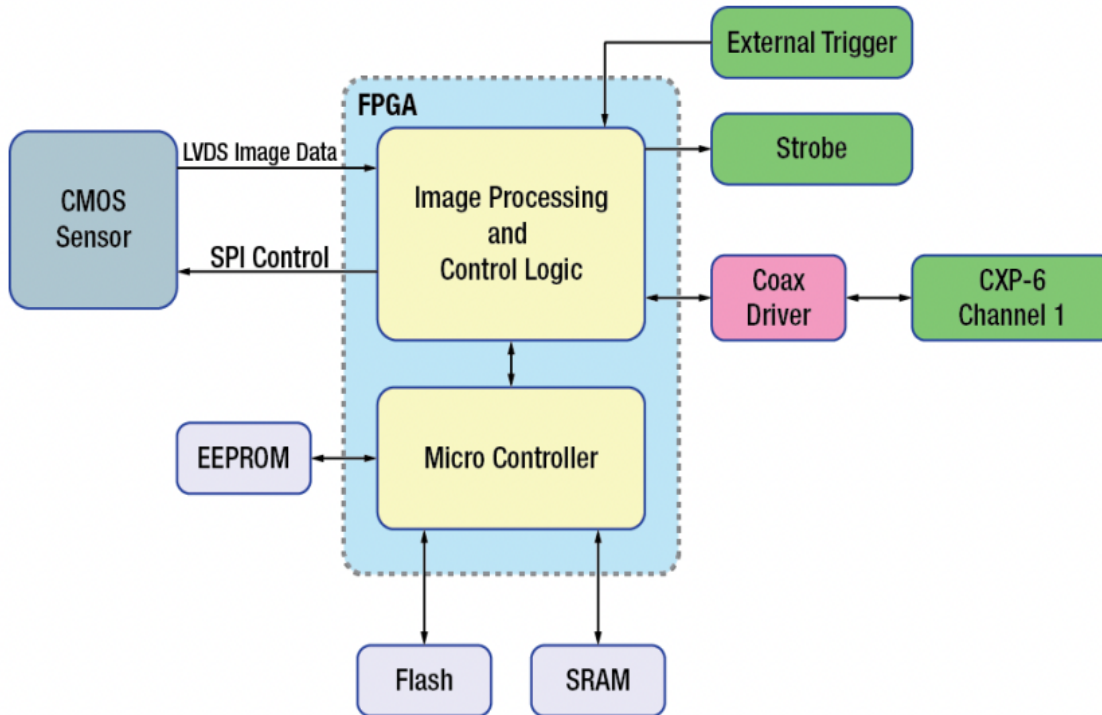


Figure 5-1 Camera Block Diagram

All controls and data processing of the camera are carried out in one FPGA chip. The FPGA generally consists of a 32-bit RISC Micro-Controller and Processing & Control logic. The Micro-Controller receives commands from the user through the CoaXPRESS interface and then processes them.

The Processing & Control logic processes the image data received from the CMOS image sensor and then transmits data through the CoaXPRESS interface. The Processing & Control logic also controls time-sensitive trigger inputs and output signals. Furthermore, Flash and DDR3 are installed outside FPGA. The DDR3 is used to process images and the Flash stores the firmware to operate the Micro-Controller.

## 5.4 Spectral Response

The following graph shows the spectral response of the VC-4MX-M144F monochrome camera.

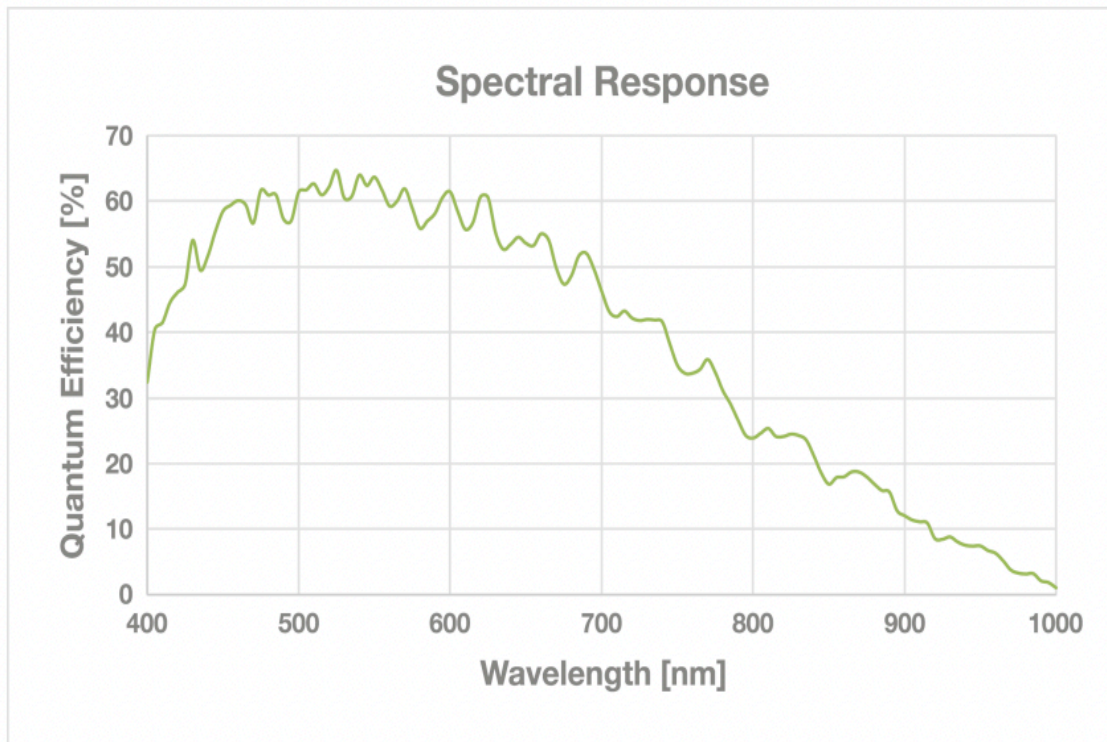


Figure 5-2 VC-4MX-M144F Spectral Response

### 5.5 Mechanical Specification

The camera dimensions in millimeters are shown in the following figure.

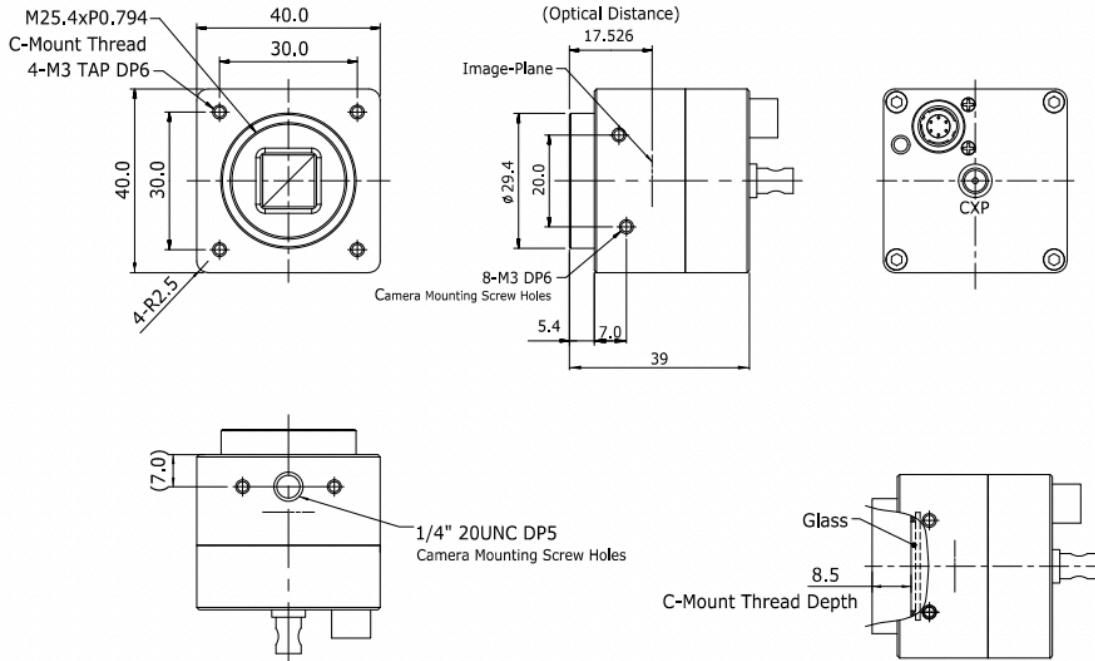


Figure 5-3 VC-4MX-M144F Mechanical Dimension

