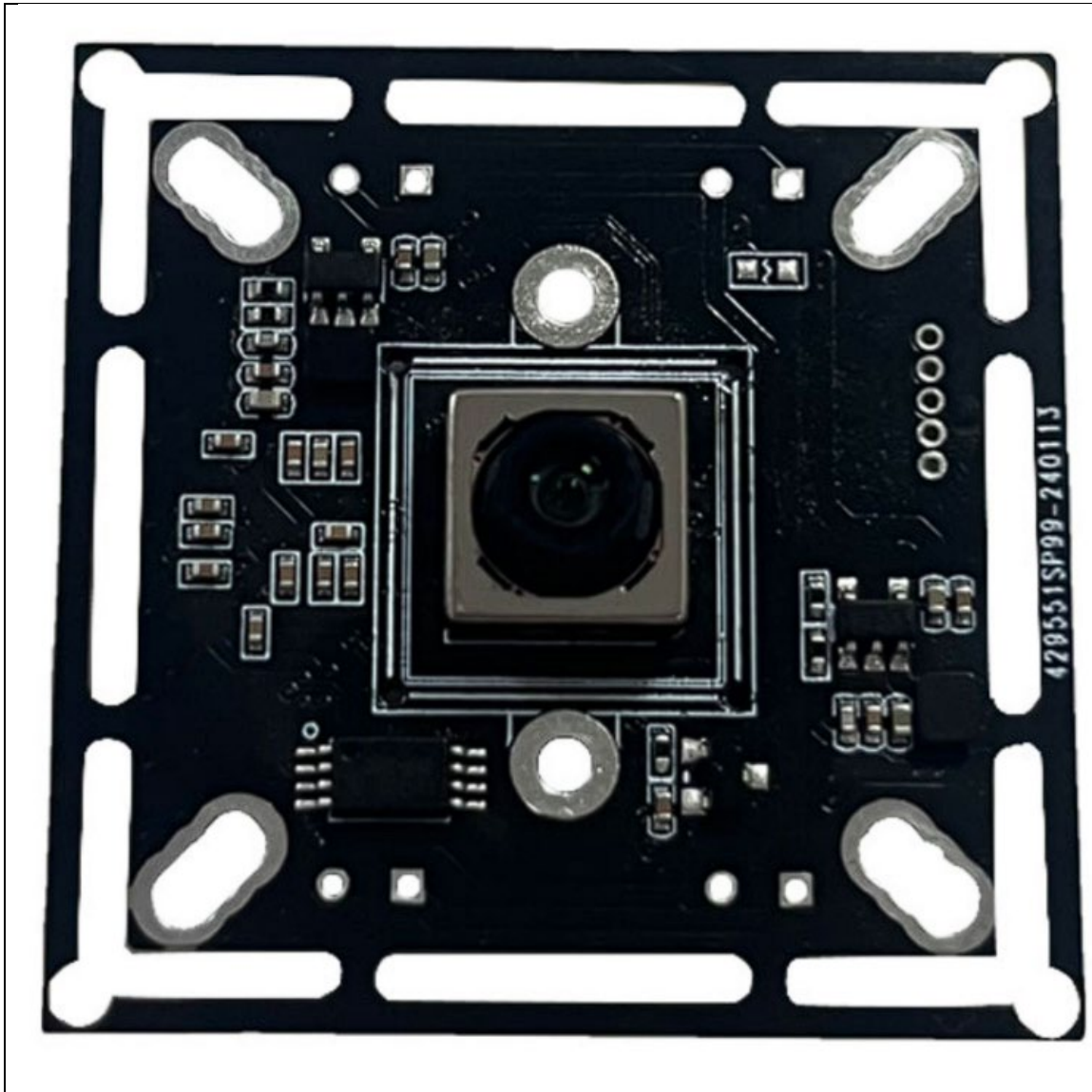


U20-CAM-IMX298AF User Manual



1 Description

The U20-CAM-IMX298AF is a professional-grade 16-megapixel USB2.0 UVC camera module built around the genuine original Sony IMX298 Exmor RS sensor.

Equipped with a F2.0 aperture, 3.432 mm focal length, 88° DFoV low-distortion lens, it delivers natural field of view with excellent edge-to-edge sharpness and minimum optical distortion — ideal for surveillance, industrial inspection, document scanning, video conferencing, medical imaging, AI vision and high-speed motion analysis applications.

Thanks to the large pixel size and advanced back-illuminated technology, it offers class-leading low-light sensitivity, ultra-low read noise and outstanding dynamic range.

Fully UVC compliant over USB 2.0, truly driver-free plug-and-play on Windows, Linux, Android, macOS, Raspberry Pi, Jetson, Rockchip and all major embedded platforms. Rock-solid 4624×3468@10fps with zero frame drops.

2 Key Features

- Genuine Sony IMX298 16MP Sensor – 1/2.8" Exmor RS, 1.12μm pixel, superior low-light & dynamic range
- True 4624×3468@10fps / 1920×1080@30fps rock-solid performance on USB2.0
- True USB2.0 UVC Plug-and-Play – Full bandwidth, no drivers needed
- Ultra-fast AF autofocus
- Industrial-grade 38×38 mm board, 4×M2.5 mounting holes (32 mm centers), wide temperature range
- 88° Low-Distortion Lens – 3.432 mm F2.0, DFoV 88°, TV distortion < 1.5%, bright & sharp corner-to-corner

3 Specifications

3.1 Sensor & Image Quality

Parameter	Specification
Image Sensor	Genuine Sony IMX298
Sensor Size	1/2.8" (diagonal 6.46 mm)
Active Pixels	4624 × 3468 (16 Megapixels)

Pixel Size	1.12 μm $\times$ 1.12 μm
Dynamic Range	82 dB
SNRmax	N/A
Minimum Illumination	0.01 lux (color)

3.2 Focus & Optics

Parameter	Specification
Focus Type	VCM Autofocus
Focal Length	3.432 mm
Aperture	F2.0
Diagonal FOV (DFoV)	88° ($\pm 3-5^\circ$)
Horizontal FOV (HFoV)	74°
Vertical FOV (VFoV)	58°
Optical Distortion	< 1.5% (TV distortion)
Relative Illumination	$\geq 70\%$
Lens Mount	M12 $\times$ P0.5 (with IR-cut filter)
Shutter Type	Rolling Shutter

3.3 Video Output & Performance

Resolution	MJPEG fps	YUY2 fps
4624×3468	10 fps	N/A
4608×3456	10 fps	N/A
4160×3120	10 fps	N/A
3840×2160	30 fps	N/A
3264×2448	10 fps	N/A
2592×1944	10 fps	N/A

2048×1536	10 fps	N/A
1920×1080	30 fps	5 fps
1600×1200	10 fps	5 fps
1280×720	30 fps	10 fps
800×600	10 fps	10 fps
640×480	10 fps	10 fps

3.4 Interface & Controls

Parameter	Specification
Interface	USB 2.0 5-PIN 1.25MM Socket (backward compatible)
Protocol	UVC (driver-free)
Adjustable Parameters	Brightness, Contrast, Saturation, Sharpness, Gamma, White Balance, Exposure, Gain, Flip, Mirror, etc.

3.5 Power & Electrical

Parameter	Specification
Power Supply	USB 5V bus power
Operating Current	<200 mA (peak N/A)
Standby Current	≤10 mA

3.6 Environmental & Physical

Parameter	Specification
Operating Temperature	-20°C to +60°C
Storage Temperature	-20°C to +85°C
PCB Dimensions	38 × 38 mm
Mounting Holes	4 × M2.5 (32 mm centers)
Total Height	≈5.4 mm (lens included)

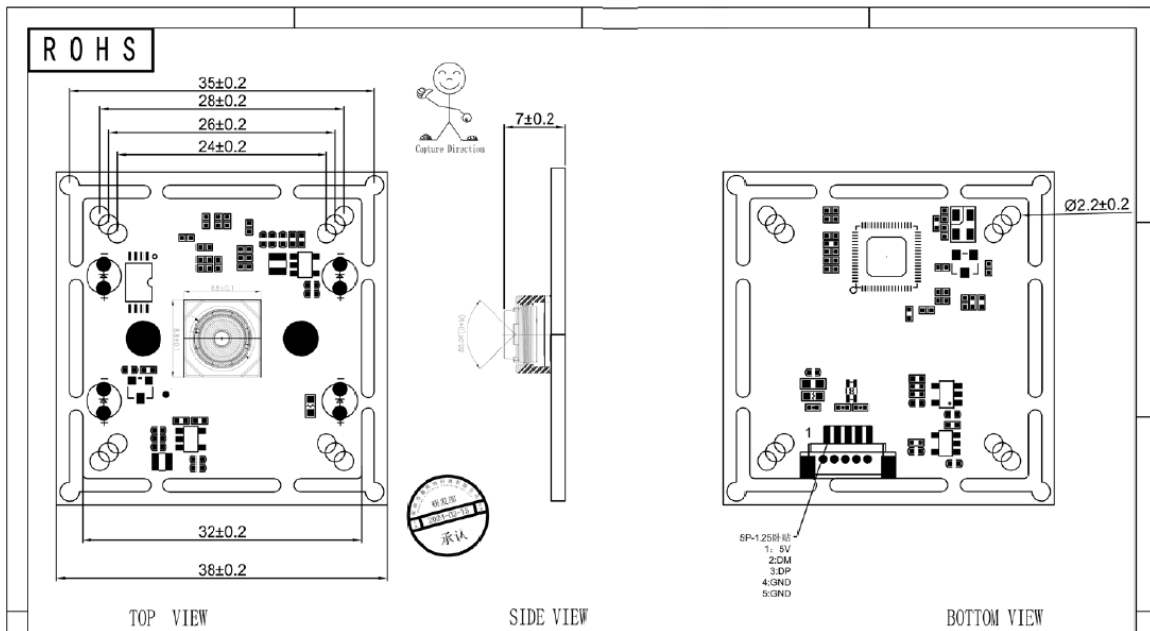
Weight	≈15–20 g
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3.7 Compatibility

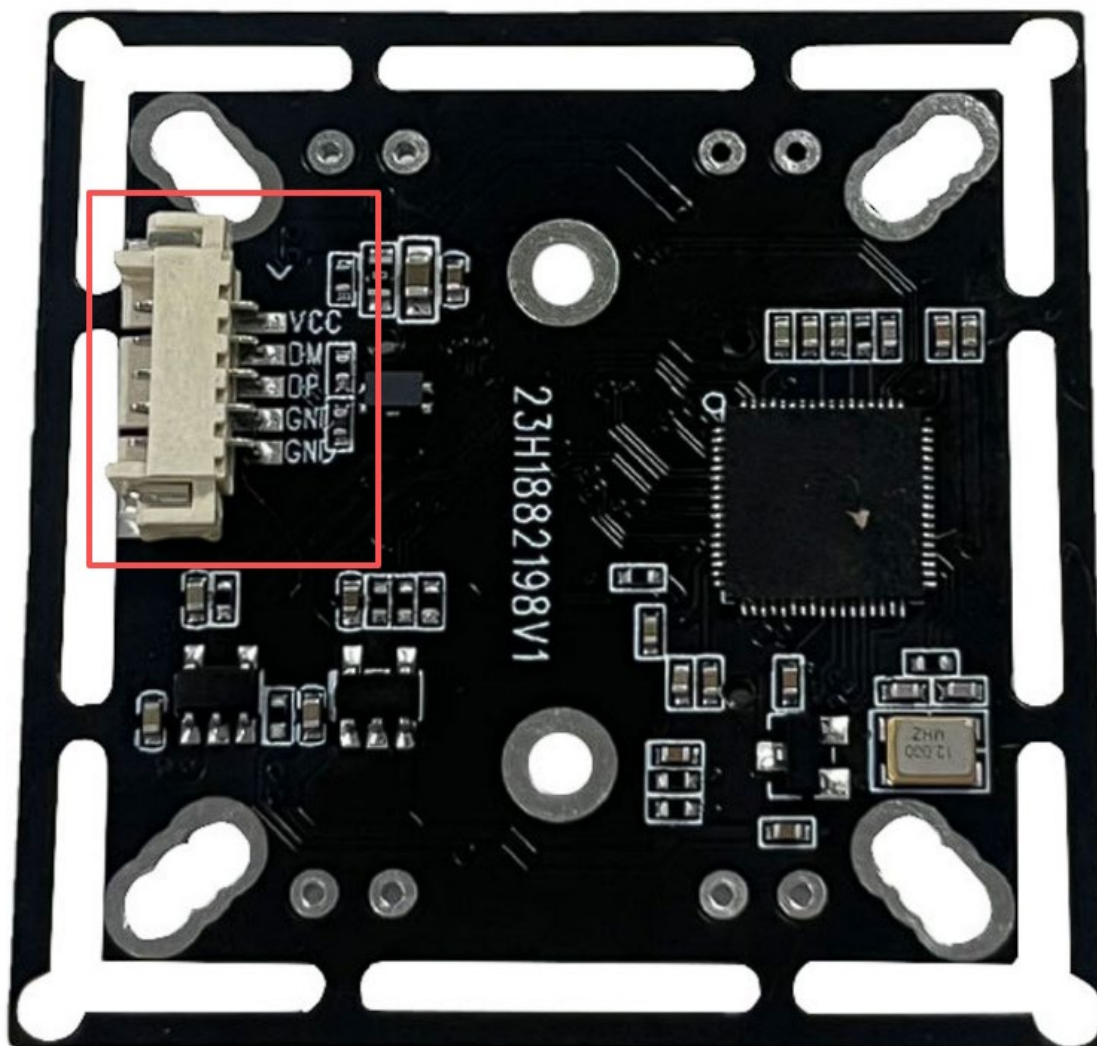
Parameter	Specification
Supported OS	Windows XP–11, Linux (kernel 2.6.26+), macOS 10.4.8+, Android 4.0+ (with UVC support), Wince, etc.
Supported Hardware	Raspberry Pi series (all models), NVIDIA Jetson (Nano, Xavier, Orin), Rockchip RK series (e.g., RK3399, RK3588), Allwinner boards, Qualcomm Snapdragon dev kits (e.g., QCS610), TI OMAP/PandaBoard, Intel NUC, BeagleBone, ODROID, and other ARM-based single-board computers (SBCs) with integrated UVC drivers via Linux kernel or native support.

4 Hardware

4.1 Size Information



4.2 Pins Out



5pin-1.0mm

PIN	Signal Name	Description
1	VCC	5V Power
2	DM	USB2.0 Data+
3	DP	USB2.0 Data-
4	GND	GND
5	GND	GND

5 Software

Category	Software/Tool	Link & Description
GUI Viewers	gucvview	https://gucvview.sourceforge.net/ The most classic & stable Linux UVC viewer, full controls, recording, rock-solid
GUI Viewers	QtCAM	https://github.com/econsystems/QtCAM Beautiful modern Qt interface, best for 4K/8K high-res modules, excellent color tuning
GUI Viewers	Cheese	https://wiki.gnome.org/Apps/Cheese Simple GNOME webcam app – perfect for quick photos/videos
CLI / Debug Tools	v4l2-ctl (v4l-utils)	https://linuxtv.org/wiki/index.php/V4l-utils The #1 must-have tool – query formats, adjust every UVC control (exposure, focus, WB, etc.)
CLI Snapshot	fswebcam	https://www.sanslogic.co.uk/fswebcam/ One-line photo capture, banners, timestamps, overlays
Streaming Server	mjpg-streamer	https://github.com/jacksonliam/mjpg-streamer Still the king in 2025 – ultra-low latency MJPEG/HTTP stream, Raspberry Pi favorite
Surveillance / NVR	Motion / MotionEye	https://github.com/Motion-Project/motion Best motion-detection recording system + beautiful web UI (MotionEye)
Surveillance / NVR	ZoneMinder	https://zoneminder.com/ Professional-grade NVR, supports hundreds of cameras, ONVIF, AI detection

BUELEC	U20-CAM-IMX298AF 16MP USB2.0 UVC camera module
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Development Libraries	libuvc	https://github.com/libuvc/libuvc Cross-platform UVC core library (C) – foundation of OpenCV, ROS, AndroidUSBCamera
Android Development	AndroidUSBCamera	https://github.com/jiangdongguo/AndroidUSBCamera Best Android UVC library in 2025 – multi-cam preview/recording, zero lag
Universal Recording/Transcoding	FFmpeg	https://ffmpeg.org/ God-tier tool – record raw UVC stream with one command, any format conversion
Computer Vision / AI	OpenCV	https://opencv.org/ VideoCapture(0) instantly opens any UVC camera for AI/projects

6 Packing List

1 × U20-CAM-IMX298AF camera module

1 × 1 meter USB2.0 cable

(Optional: 2 m / 3 m / 5 m shielded cable, tripod adapter, acrylic case)

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