

U30-CAM-IMX415 User Manual



1 Description

The U30-CAM-IMX415 is a professional-grade 8-megapixel (4K) USB3.0 UVC ultra-wide-angle camera module built around the genuine original Sony IMX415 STARVIS back-illuminated CMOS sensor. Equipped with a **high-brightness F1.8, 2.26mm focal length, 120° diagonal ultra-wide low-distortion lens**, it delivers an expansive field of view with minimal barrel distortion — perfect for security monitoring, panoramic video conferencing, smart doorbells, robot navigation, and wide-scene industrial inspection. Thanks to the 1/2.8" sensor and 1.45µm pixels combined with STARVIS technology, it offers class-leading low-light sensitivity, ultra-low read noise, and excellent dynamic range even in near-darkness conditions.

Fully UVC 1.5 compliant over USB 3.0 (5 Gbps), truly driver-free plug-and-play on Windows, Linux, Android, macOS, Raspberry Pi, Jetson, Rockchip and all major embedded platforms. Rock-solid 4K@30fps MJPEG with zero frame drops.

2 Features

1. **Genuine Sony IMX415 8MP Sensor** – 1/2.8" STARVIS back-illuminated CMOS, large 1.45µm pixel, exceptional low-light performance & low noise
2. **True 4K@30fps Performance** – 3840×2160 @30fps MJPEG stable on USB3.0, smooth 4K video with zero frame drops
3. **True USB3.0 UVC 1.5 Plug-and-Play** – Full 5 Gbps bandwidth, no drivers needed on any major OS or embedded platform
4. **Superior Low-Light Sensitivity** – STARVIS technology, minimum illumination 0.5 lux, high SNR, ideal for night vision & indoor use
5. **Industrial-Grade Reliability & Compact Design** – 38×38mm board, wide temperature range, full AEC/AWB/AGC control, proven DECCIN hardware platform
6. **120° Ultra-Wide-Angle Low-Distortion Lens** – 2.26mm F1.8, DFoV 120°, TV distortion <5%, excellent corner sharpness and brightness

3 Specifications

1. Sensor & Image Quality

Parameter	Specification
Image Sensor	Genuine Sony IMX415 Exmor RS CMOS (STARVIS technology)
Sensor Size	1/2.8"
Active Pixels	3840(H) × 2160(V) – 8.3 Megapixels
Pixel Size	1.45μm × 1.45μm
SNR	≥36 dB (typical)
Dynamic Range	72 dB
Sensitivity	1.4 V/lux-sec @550nm
Minimum Illumination	0.5 lux (color)
Center Resolution	≥600 LW/PH

2. Focus & Optics

Parameter	Specification
Focus Type	Fixed Focus (hyperfocal, sharp from 15 cm to ∞)
Focal Length	2.26 mm
Aperture	F1.8
Diagonal FOV (DFoV)	120° (±5°)
Horizontal FOV (HFOV)	≈102°
Vertical FOV (VFOV)	≈76°

Optical Distortion	< 5% (TV distortion)
Relative Illumination	≥ 65%
Lens Mount	M12 × P0.2 (metal, with IR-cut filter coated)
Lens Format	1/2.8 inch
CRA (Chief Ray Angle)	Matched to IMX415 sensor
Shutter Type	Rolling Shutter

3. Video Output & Performance

Parameter	Specification
Output Formats	MJPEG / YUY2 (YUYV)
Supported Resolutions & Frame Rates (USB3.0)	3840×2160 (4K) @30fps MJPEG / @15fps YUY2 2560×1440 @30fps MJPEG / @30fps YUY2 1920×1080 @30fps MJPEG / @30fps YUY2 1280×720 @30fps MJPEG / @30fps YUY2 640×480 @30fps MJPEG / YUY2 (Higher frame rates available via binning/subsampling on lower resolutions)

4. Interface & Controls

Parameter	Specification
Interface	USB 3.0 Type-C (5 Gbps, backward compatible USB2.0)
Protocol	UVC 1.5 (full compliance, driver-free plug-and-play)
AEC / AWB / AGC	Fully supported
Adjustable Parameters	Brightness, Contrast, Contrast, Hue, Saturation, Sharpness, Gamma, White Balance, Exposure, Gain, Backlight Compensation, Power Line Frequency, Flip, Mirror, etc.

5. Power & Electrical

Parameter	Specification
Power Supply	USB 5V bus power
Operating Current	180mA – 200mA
Standby Current	≤10 mA

6. Environmental & Physical

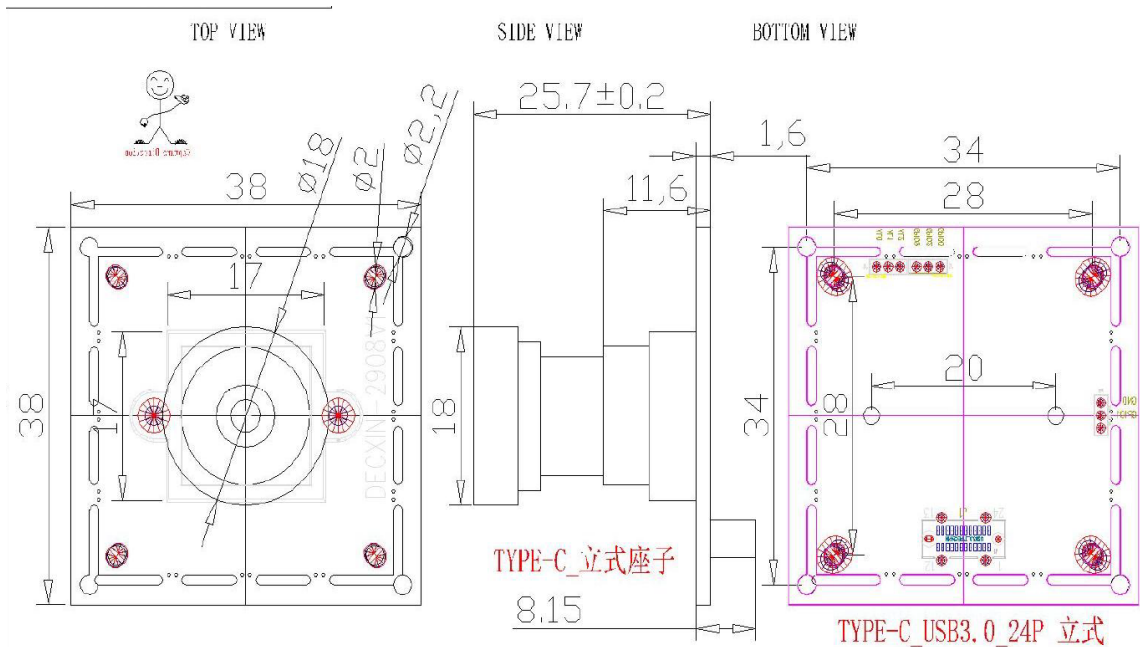
Parameter	Specification
Operating Temperature	0°C to +60°C
Storage Temperature	-20°C to +70°C
PCB Dimensions	38mm × 38mm square board
Total Height with Lens	≈25.7 mm (±0.2mm, fixed lens version)
Mounting Holes	4 × M2 mounting holes, 32mm center-to-center
Weight	≈15 g
Standard Cable	1 meter USB3.0 cable
Optional Cables	2m / 3m / 5m shielded USB3.0 cables

7. Compatibility

Parameter	Specification
Supported OS	Windows XP/7/8/10/11, Linux (UVC kernel 2.6.26+), macOS 10.4.8+, Android 4.0+ with UVC support, Raspberry Pi, Jetson Nano/Xavier/Orin, Rockchip RK series, etc.

4 Hardware

4.1 Size information



4.2 Pins Out



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AVDD(Analog VDD): 2.9V

DVDD(Digital VDD): 1.2V

DOVDD(Digital Output VDD): 1.8V

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	U30-CAM-IMX415 8MP 4K USB3.0 UVC Fixed Focus Camera Module – Genuine Sony IMX415
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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

1xU30-CAM-IMX415

1xUsb Type C Cable

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