

DAVIS 240

The DAVIS 240 is a 240 x 180 pixels DVS event camera with simultaneous active pixel frame output and USB 2.0 interface.



Specifications

DVS Resolution	240 x 180 pixels
Frame Resolution	240 x 180 pixels, Grayscale, Simultaneous output
DVS Dynamic range	120 dB
Min. latency	~ 12 us @ 1 klux with optimized biases
Lens mount	CS-mount
Connectors / Power	USB 2.0 micro
Bandwidth	12 MEvents / second
Software	DV-Platform
Power consumption	< 180mA @ 5V DC
Dimensions	H 56 x W 62 x D 28 [mm]
Weight	75g (without lens)
Hardware multi-camera sync	Supported, 3.5 mm jack connector
IMU	6-Axis Built-in
Case	Exposed board, machined plastic lens mount
Tripod mount	Whitworth ¼" female
APS Frame Shutter	Configurable, Global or Rolling Shutter
CMOS Technology	0.18 um 1P6M MIM CIS
Chip size	5 x 5 [mm]
Pixel size	18.5 x 18.5 [um]
Array size	3.33 x 4.44 [mm]
Fill factor	22 %
Pixel complexity	48 transistors, 2 capacitors, 1 photodiode with micro-lens
Chip voltages	1.8 V and 3.3 V
Chip power consumption	5-14mW (activity dependent)

Specifications not guaranteed. All specifications subject to change without notice

Physical dimensions

The DAVIS 240 camera is half covered with a machined polycarbonate case.

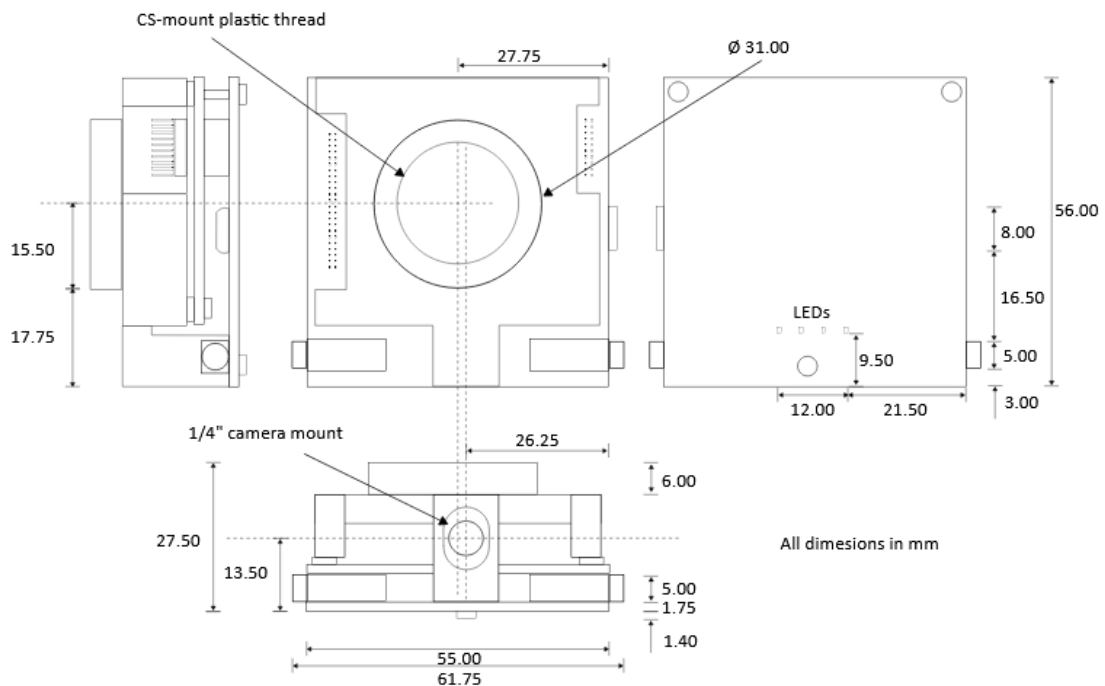


Figure 1 Dimensions of the DAVIS 240 camera case

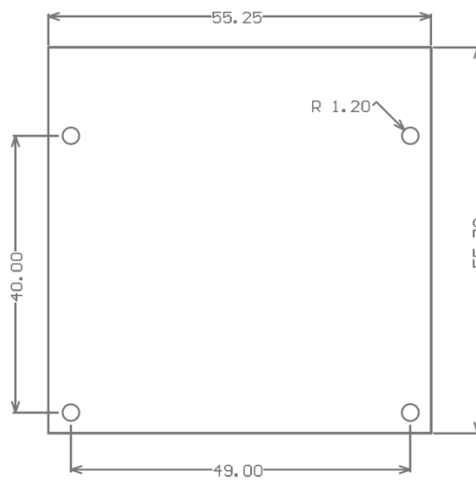


Figure 2 Bottom board dimensions

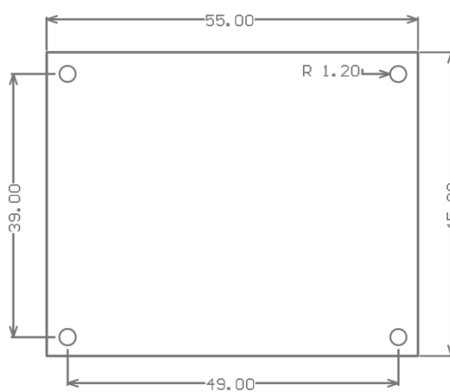


Figure 3 Top board dimensions

Connectors

DAVIS 240 has three connectors. One USB 2.0 connector for data and power and two pin headers for serial AER data, control and synchronization.

Signal connector

The signal connector is a 40-pin connector that exposes pins from the DVS chip to the outside. It can be used to directly connect neuromorphic hardware to the camera.

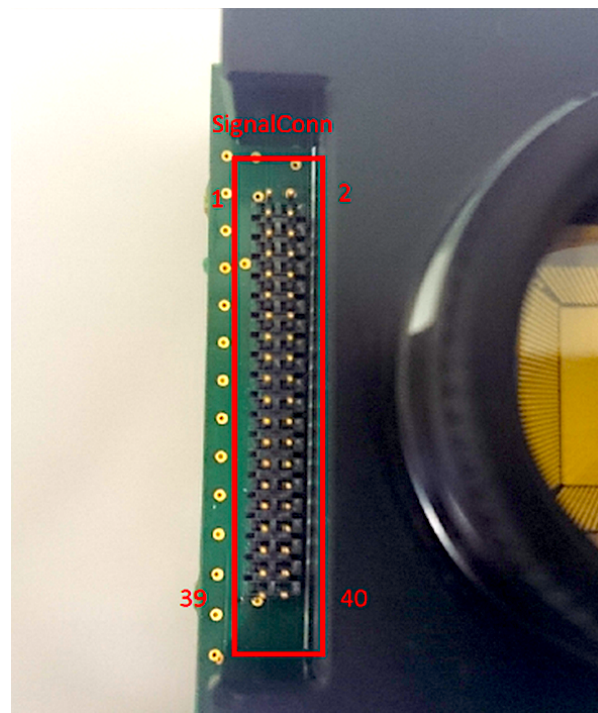


Figure 4 Location of the signal connector

The pinout of the signal connector is as follows

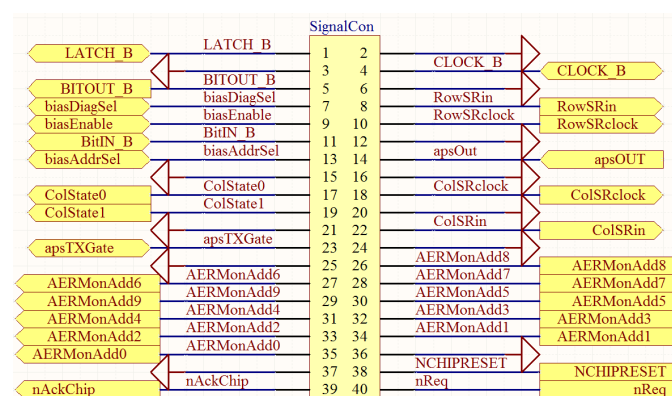


Figure 5 Signal connector pinout for DAVIS 240 (A / B)

Note: The pinout for DAVIS 240C is identical, except AERMonAdd6 and 7 pins are being inverted.

Feed Connector

The feed connector carries power signals, I²C and IMU signals.

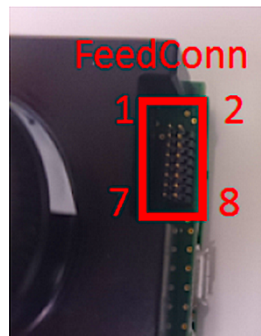


Figure 6 Feed connector location on DAVIS 240

The pinout of the feed connector is as follows

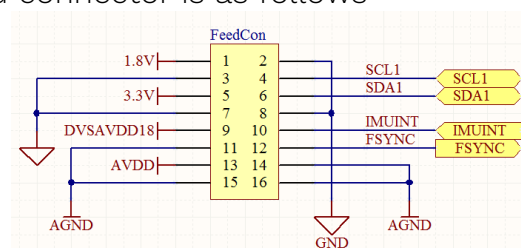


Figure 7 Feed connector pinout on DAVIS 240

Optics

The camera lens mount is designed to accommodate CS-mount lenses. Other lenses can be accommodated by using adapters. The standard lens shipped with the camera is a C-mount lens and ships with an adapter. The chip requires a lens designed for 1/3-inch imagers.

The field of view (FOV) depends on the focal length L of the lens and the size W of the pixel array. It is computed from geometrical optics, not accounting for any lens distortion. The angular field of view ($AFOV$) is given by:

$$AFOV = 2 \tan^{-1} \left(\frac{W}{2L} \right)$$

The linear FOV ($LFOV$) at a distance D from the lens is given by

$$LFOV = D * W/L$$

The pixel array has a resolution of 240 x 180 and measures:

- Width: 240 pixels x 18.5 um/pixel = 4.44 mm
- Height: 180 pixels x 18.5 um/pixel = 3.33 mm

The following table shows the horizontal and vertical field of view in degrees and its size at various distances for different common focal lengths.

Computations of Field of View

Lens focal length [mm]		3.5	4.5	6	12
Angular field of view horizontal [deg]		64.6	52.3	40.5	20.9
Angular field of view vertical [deg]		50.6	40.4	30.9	15.7
Angular field of view diagonal [deg]		76.6	63.1	49.4	25.9
Linear field of view horizontal [cm]	dist. 10 cm	12.6	9.8	7.4	3.7
	dist. 30 cm	37.9	29.5	22.1	11.1
	dist. 100 cm	126.3	98.3	73.7	36.8

Software

DAVIS 240 is compatible with DV software platform. Go to inivation.com to access the newest version of the software and SDK.

Serial number

The serial number of the device can be found on the case, usually a four-digit number printed on a black label located at the top of the camera case.

Package contents

DAVIS 240 ships with the following items

- DAVIS 240 camera
- USB 2.0 cable, 1m
- Varifocal C mount lens
- CS to C mount lens adapter