Raspberry Pi AI Camera

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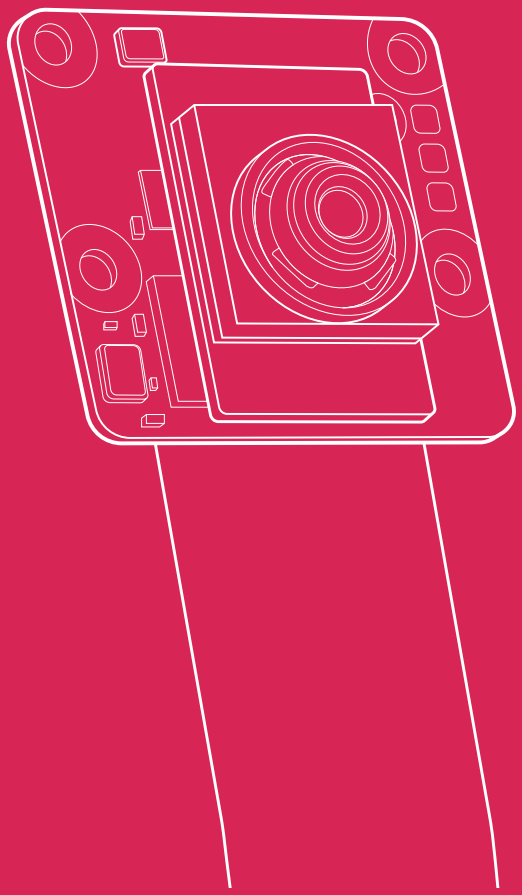

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Overview

The Raspberry Pi AI Camera is a compact camera module from Raspberry Pi, based on the Sony IMX500 Intelligent Vision Sensor. IMX500 combines a 12-megapixel CMOS image sensor with on-board inferencing acceleration for a variety of common neural network models, enabling users to develop sophisticated vision-based AI applications without the need for a separate accelerator.

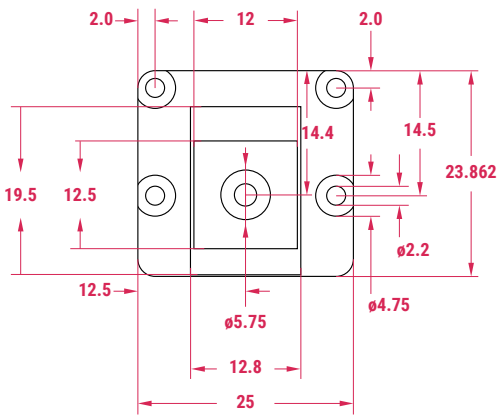
The AI Camera transparently augments captured still images or video with tensor metadata, leaving the processor in the host Raspberry Pi free to perform other operations. Support for tensor metadata in the libcamera and Picamera2 libraries, and in the rpicam-apps application suite, make it easy for beginners to use, while offering advanced users unparallelled power and flexibility.

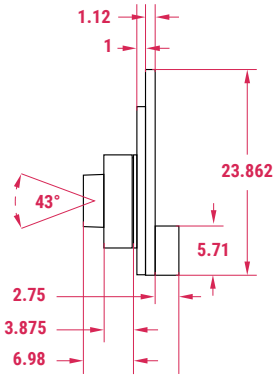
The Raspberry Pi AI Camera is compatible with all Raspberry Pi computers. The PCB outline and mounting hole locations are identical to those of Raspberry Pi Camera Module 3, while the overall depth is greater to accommodate the larger IMX500 sensor and optical subassembly.

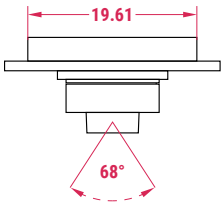
Specification

Sensor:	Sony IMX500
Resolution:	12.3 megapixels
Sensor size:	7.857 mm (type 1/2.3)
Pixel size:	1.55 µm × 1.55 µm
Horizontal/vertical:	4056 × 3040 pixels
IR cut filter:	Integrated
Autofocus system:	Manual adjustable focus
Focus range:	20 cm – ∞
Focal length:	4.74 mm
Horizontal field of view:	66 ±3 degrees
Vertical field of view:	52.3 ±3 degrees
Focal ratio (F-stop):	F1.79
Infrared sensitive:	No
Output:	Image (Bayer RAW10), ISP output (YUV/RGB), ROI, metadata
Input tensor maximum size:	640(H) × 640(V)
Input data type:	'int8' or 'uint8'
Memory size:	8388480 bytes for firmware, network weight file, and working memory
Framerate:	2×2 binned: 2028×1520 10-bit 30fps Full resolution: 4056×3040 10-bit 10fps
Dimensions:	25 × 24 × 11.9 mm
Ribbon cable length:	200 mm
Cable connector:	15 × 1 mm FPC or 22 × 0.5 mm FPC
Operating temperature:	0°C to 50°C
Compliance:	For a full list of local and regional product approvals, please visit pip.raspberrypi.com
Production lifetime:	The Raspberry Pi AI Camera will remain in production until at least January 2028

Physical specification







Note:

All dimensions in mm

All dimensions are approximate and for reference purposes only. The dimensions shown should not be used for producing production data

The dimensions are subject to part and manufacturing tolerances

Dimensions may be subject to change

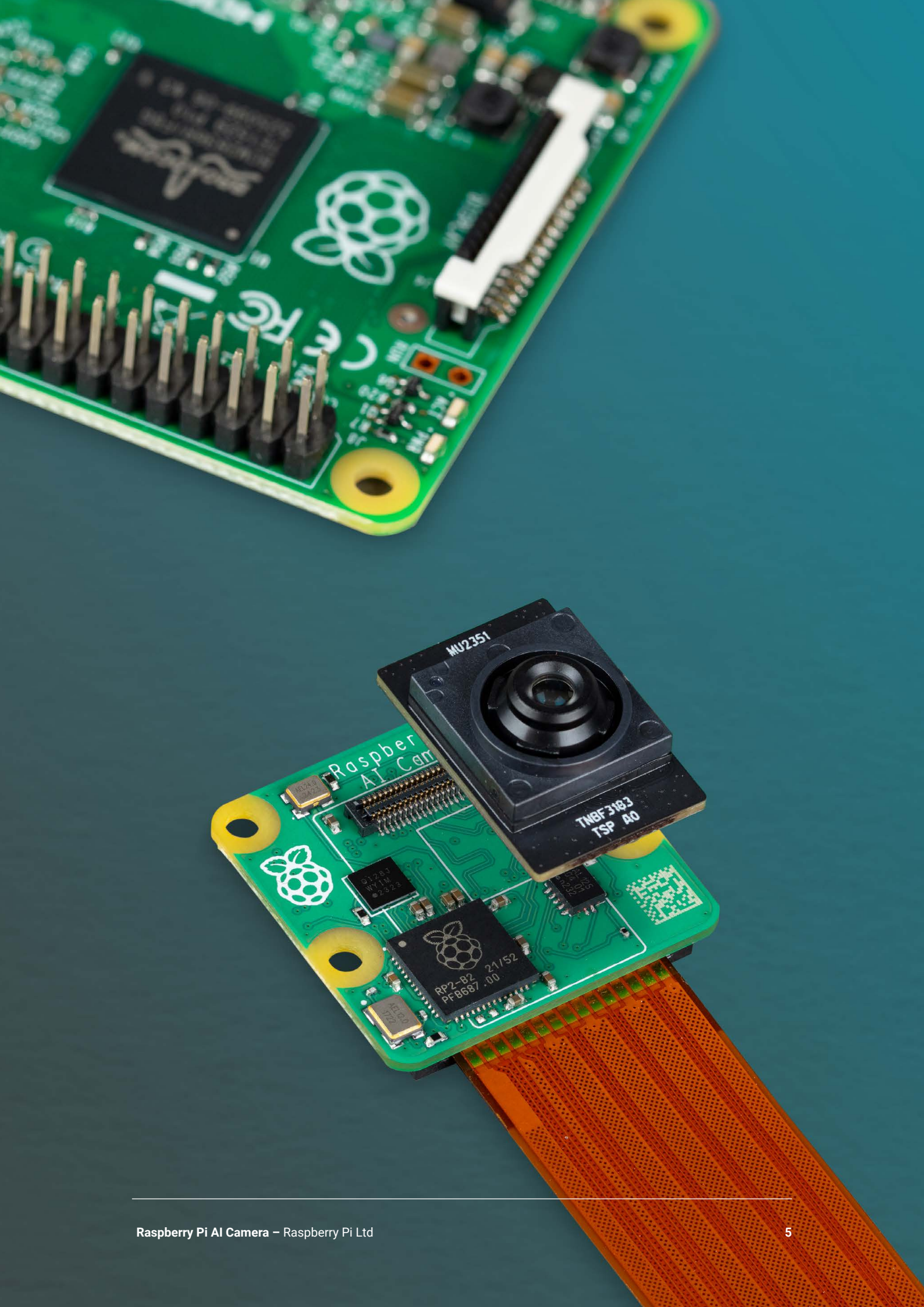
WARNINGS

- This product should be operated in a well ventilated environment, and if used inside a case, the case should not be covered.
- Whilst in use, this product should be firmly secured or should be placed on a stable, flat, non-conductive surface, and should not be contacted by conductive items.
- The connection of incompatible devices to Raspberry AI Camera may affect compliance, result in damage to the unit, and invalidate the warranty.
- All peripherals used with this product should comply with relevant standards for the country of use and be marked accordingly to ensure that safety and performance requirements are met.

SAFETY INSTRUCTIONS

To avoid malfunction or damage to this product, please observe the following:

- Important: Before connecting this device, shut down your Raspberry Pi computer and disconnect it from external power.
- If the cable becomes detached, first pull forward the locking mechanism on the connector, then insert the ribbon cable ensuring that the metal contacts face towards the circuit board, and finally push the locking mechanism back into place.
- This device should be operated in a dry environment at normal ambient temperatures.
- Do not expose to water or moisture, or place on a conductive surface whilst in operation.
- Do not expose to heat from any source; Raspberry Pi AI Camera is designed for reliable operation at normal ambient temperatures.
- Store in a cool, dry location.
- Avoid rapid changes of temperature, which can cause moisture to build up in the device, affecting image quality.
- Take care not to fold or strain the ribbon cable.
- Take care whilst handling to avoid mechanical or electrical damage to the printed circuit board and connectors.
- Whilst it is powered, avoid handling the printed circuit board, or handle it only by the edges, to minimise the risk of electrostatic discharge damage.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