PA1 Person Detection Module

Description: The PA1 Person Detection Module enables you to quickly and easily add smarts to your IoT deployment to monitor and detect for humans. You can use this module indoors and outdoors to understand where and when humans arrive at your deployment site.
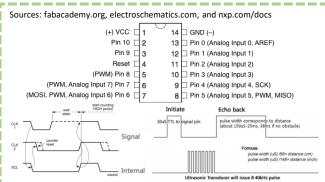
Features:
- Real-time Person Detection with On-Device ML
- Indoor and Outdoor use
- Finds a person at a maximum distance of 10 meters to a minimum distance of 5 centimeters
- Operates in low and high light environments (1-20000 Lux) across a wide temperature range (0 to 50 ^{O}C)
- Features Color and Black-and-White Detection Modules

Use Cases:
- Smart business and home security systems
- Multi-modal key word spotting for virtual assistants
- Occupancy sensors and other infrastructure sensors
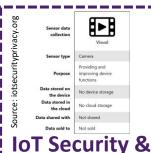
Description, Features, and Use Cases

Sources: fabacademy.org, electroschematics.com, and nxp.com/docs

Communication Specification and Pinout

Source: datanutrition.org

Dataset Nutrition Label

Source: iotsecurityprivacy.org

IoT Security & Privacy Label

Source: docs.luxonis.com
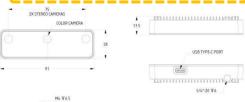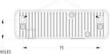
Diagrams and Form Factor

Compliance

Camera Specs	Color camera	Stereo pair
Sensor	IMX214	OV7251
DFOV / HFOV / VFOV	81° / 69° / 54°	86° / 73° / 58°
Resolution	13MP (4208x3120)	480P (640x480)
Focus	AF: 8cm - ∞ **OR** FF: 50cm - ∞	Fixed-Focus 6.5cm - ∞
Max Framerate	60 FPS	200 FPS
F-number	2.2 ± 5%	2.2
Lens size	1/3.1 inch	1/7.5 inch
Effective Focal Length	3.37mm	1.3mm
Distortion	< 1%	< 1.5%
Pixel size	1.12µm x 1.12µm	3µm x 3µm

SYMBOL	RATING	MIN	MAX	UNIT
V_{BUS}	Recommended Input Supply Voltage	4.75	5.25	V
V_{BUS_MAX}	Maximum Input Supply Voltage	3.5	5.5	V
I_{VBUS_MAX}	Maximum Input Supply Current	0	1.5	A
P	Power Required	4	6	W
P_{IDLE}	Idle Power Draw	2.4	2.6	W
T_A	Ambient Operating Temperature	45	55	^{O}C
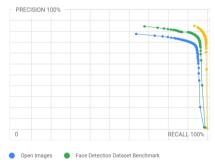
Hardware Characteristics

Source: docs.luxonis.com

- Open Images
- Face Detection Dataset Benchmark
- Labeled Faces in the Wild

Model performance:
Measured with Precision-Recall (PR) and Area Under the PR Curve (PR-AUC). Download raw performance results data here. Disaggregated performance measured with Recall, which captures how often the model misses faces with specific characteristics. Equal recall across subgroups corresponds to the "Equality of Opportunity" fairness criterion.

Performance evaluated on:
- A subset of Open Images
- Face Detection Data Set and Benchmark
- Labeled Faces in the Wild

Model Characteristics

Source: modelcards.withgoogle.com

Environmental Impact: Full report can be found here.

390g CO_2-eq

23L Water

Environmental Impact

Source: st.com

Performance Analysis
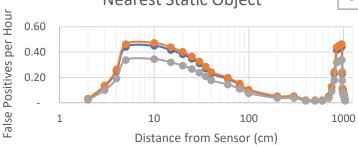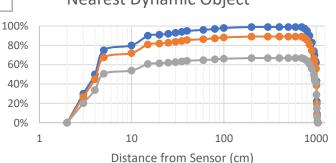
False Positive Rate vs Distance from Nearest Static Object

- Indoor
- Outdoor
- Low light

False Positives per Hour — Distance from Sensor (cm)

Detection Accuracy vs Distance to Nearest Dynamic Object

Test Accuracy — Distance from Sensor (cm)