Canon AI Powered Vision System

NVIDIA.

Processor Unit

Processor	NVIDIA Jetson TX2
Exterior	Fan-less Aluminum Extrusion
Interface	GPIO, USB3.0, HDMI, Ethernet
Storage	512GB SSD
WLAN	802.11ac WiFi, LTE(Plan)
Dimension	79mm x 79mm x 147mm
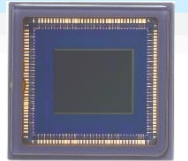
Canon

Weight	1061g

Sensor Unit

Image Sensor	Canon 5M Global Shutter CMOS
Exterior	Aluminum Extrusion
Optics	C Mount Lens
Dimension	38mm x 38mm x 80mm
Weight	167g

CMOS Sensor + GPU Edge AI Solution

(Conventional) PC Based Solution

AIPVS Edge Solution

| app | Application | | app | Application |

kernel | USB Video Class | | kernel | V4L2 Framework

Asynchronous | | Synchronous

device | Sensor | DRAM | GPU (VRAM) | | device | Sensor | DRAM | GPU (VRAM)

✓ AI Inference
✓ Image Processing
etc.

~16GBps (PCIEcpress3.0 x16)

~56GBps
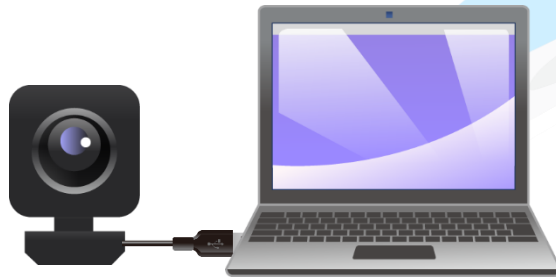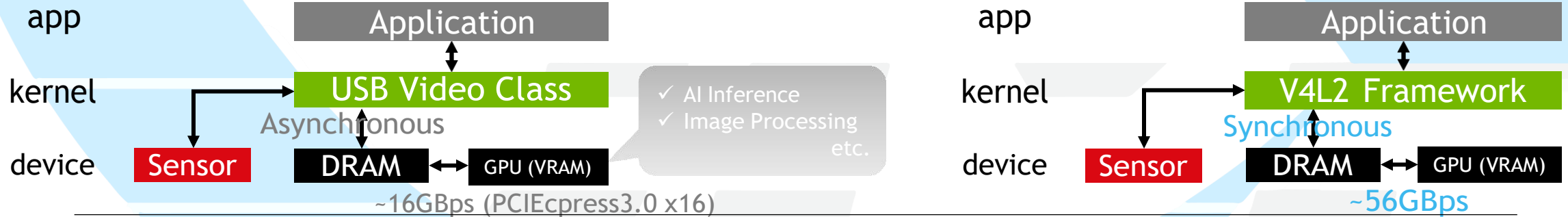
	Architecture	
Software Based	Architecture	Hardware Based
High	Latency	Very Low
Low	Scalability	High

Chip-level Collaboration enables low latency and scalable application

AI Image Solution for Smart City

Inspection

AIVS enables complex detections accurately in various environments to recognize moving objects using patterns and AI recognition algorithm.

Marketing

AIVS enables independent monitoring such as stock inventory management and risk prediction etc, while reducing the network load with edge processing

Monitoring

AIVS recognize customers and product movements to streamline your store operations.

Smart City

The application of AIVS is not limited to inspection, monitoring and marketing. By combining AIVS with large scale computing resources, contribute to development of smart city.

AI powered vision system

Vision system capable of PC-less AI machine vision edge processing without PC

Camera Unit

Engine Unit

Camera + Engine Unit

POINT 1: Sensor made by Canon on-board
On-board 5-megapixel global shutter sensor newly developed by Canon, enabling sensor control and obtaining high quality images with API.

POINT 2: Built-in GPU
Equipped with NVIDIA GPU. This enables high speed image processing and edge computing using the CUDA core.

POINT 3: Compact, low-heat casing
Fan-less structure that releases heat directly from its casing. The camera unit can also be set at a distance of up to 3 m, so it can be used in a small space.

POINT 4: Developer's SDK provided
Newly-developed original image processing library. This makes it possible to develop software that suitscustomer's applications.

| 5-megapixel GS | Equipped with NVIDIA GPU | Linux installed | Wi-fi / LTE | C mount |

GPU fast image processing solution for customers in industry fields

Stand-alone operation that does not require a PC

The newly developed engine unit is equipped with NVIDIA GPU. Edge processing makes an image processing PC unnecessary.

Interface that supports diverse needs

Comes standard with an interface necessary for machine vision, including GPIO for external triggers and lighting ports. As communication features, it comes equipped with a wireless communications module, in addition to GbE.

Input from multiple camera systems

Future plans include providing a library that enables connecting and controlling multiple camera unit systems. This makes it possible to shoot from multiple angles and capture images with parallax.

End-to-end solution\

M2M solution

We provide end-to-end solutions including specialized hardware development and driver development, based on collaboration with NVIDIA. This solves challenges industrial field customers have who do not have development knowhow or resources.

IoT/AI Platform

The engine unit is compatible with GbE/Wi-Fi/LTE, and can be accessed from web applications/API. This contributes to building smart factories. It also uses energy saving miniaturization, a high-quality engine unit, and secure applications to ensure business scalability.

Newly developed image processing software

Device API that enables camera control

Use the device API to finely control sensitivity, exposure time, flash-synchronized shooting, and others on the specially developed Canon image sensor.

Diverse image processing library

Developed a new image processing library necessary for machine vision, including pattern matching, blob analysis, edge measurement, space filtering, and calibration. Strengths also include the capability of high speed image processing on GPU. These features contribute to streamlining visual inspection process and other processes in factories.

Camera Unit Specifications	
Resolution	2,592 (H) x 2,056 (V)
Sensor Type	CMOS, global shutter
I/F Standards	6 Gbps & power supply proprietary standard, LED flash control output
Dimensions	38 mm x 38 mm x 75.6 mm
Weight	167 g

Engine Unit Specifications	
Controller	NVIDIA JETSON TX2
OS	Ubuntu 16.04
I/F Standards	GPIO, HDMI, USB
Communications	Ethernet, Wi-Fi, LTE-equipped micro SIM
Power Supply	DC 12 V
Power Consumption	20 W or less
Log Capacity	512 GB
Dimensions	79 mm x 79 mm x 135.3 mm
Weight	1,061 g

*Specifications in this document are subject to change with no advance notice.