RAA462113FYL
Reference design for 4K and fast AF camera with AI function

Abstract

This reference design adds RZ/V series for Vision AI [1] to the Reference design for 4K and High-speed AF camera [2] that was released as Winning Combination. Saving development period of 4K cameras by utilizing offerings like PCB design information and our partners' AI solutions.

[1] https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rz-mpus/rzv-embedded-ai-mpus
[2] https://www.renesas.com/us/en/document/prb/reference-design-4k-and-high-speed-af-camera?r=532826

Feature

- 4K video output by RAA462113FYL(4K CMOS Image Sensor with PDAF [3] pixels) and Novatek ISP [4]
- Fast AF thanks to Hybrid AF(PDAF + Contrast AF)
- High-speed AI inference processing and high-power efficiency coming from Renesas' proprietary AI accelerator, DRP-AI [5] on RZ/V(1TOPS/W class)

[3] Phase Detection Auto Focus
[4] Image Signal Processor
[5] Dynamically Reconfigurable Processor-AI

Benefit

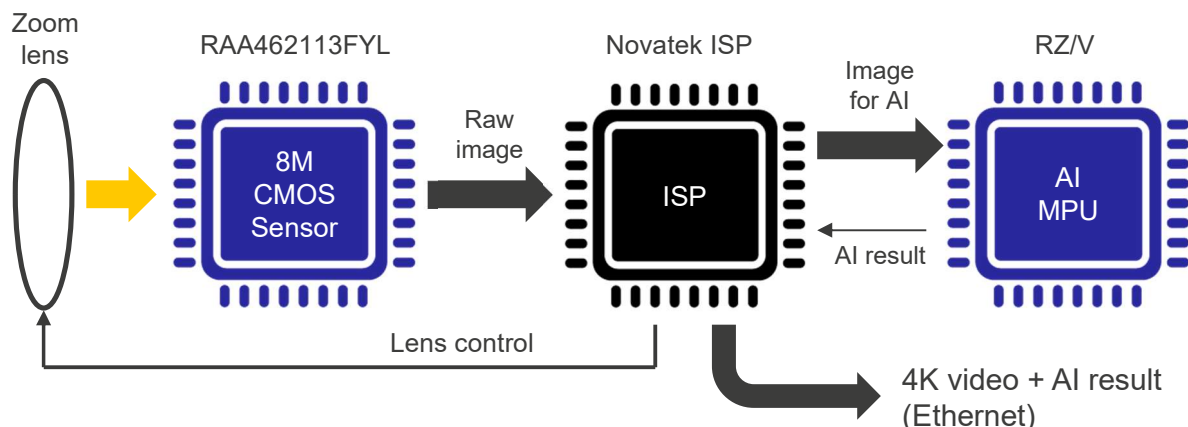Save development period of 4K cameras with fast AF&AI.
- Development period of hardware by utilizing PCB design information
- Development period of AF software by utilizing AF sample software
- Design period of AI model design by utilizing AI application [6] from RZ/V partners

[6] https://www.renesas.com/us/en/document/gde/rzv-mpu-ai-application-examples?r=1506261

Application

- Network surveillance camera
- Network video conference camera

Conceptual block diagram

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Main offering items

- PCB design information(schematic, layout pattern, and BOM list)[7]
- Sample software related to PDAF[7]
- Camera module for evaluation[8] and user's manual

Camera module for evaluation

Please contact Renesas sales as for details, conditions to provide them, and so on.

[7] Providing information and software used in camera module for evaluation
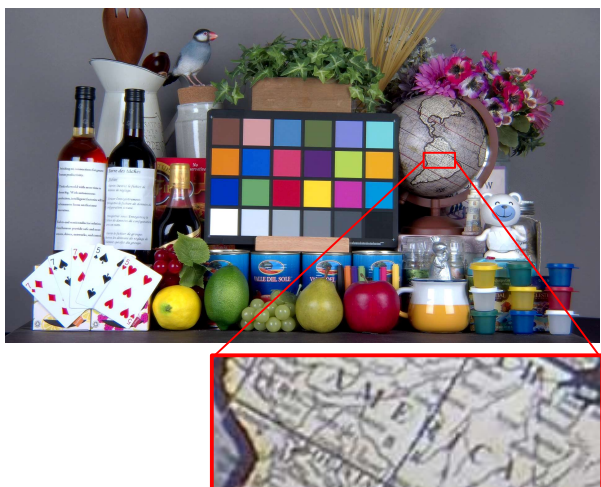[8] Two AI applications are installed

Main spec. of camera module for evaluation

Item			Spec.
Lens	Type		Electrical varifocal lens(custom mount)
	Focal length		6.8mm to 120mm
	FOV(H)		58.5°(Wide) to 3.7°(Tele)
Auto Focus			Hybrid AF(PDAF + Contrast AF)
AI inference application(sample)			Object recognition(TinyYOLOv2), Pose estimation(HRNet)
Video output	Ethernet	Codec	H.265 / H.264
		Image size	3840x2160 / 1920x1080
		Frame rate	30fps
	HDMI		3840x2160p30 / 1920x1080p30
Power			DC:12V or PoE

Sample image with camera module for evaluation
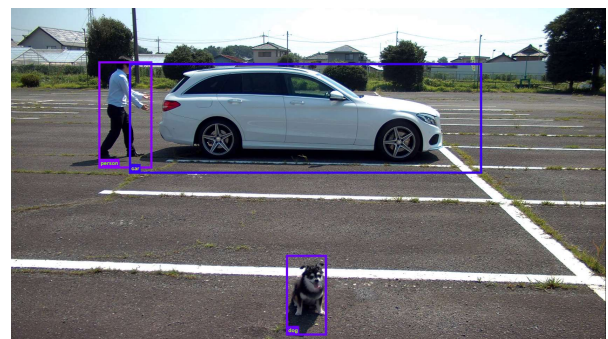
- Imaging example for studio set

Small characters can be recognized thanks to 4K resolution

- Example of AI inference(TinyYOLOv2)

AI recognition can distinguish each object

☐ Person   ☐ Car   ☐ Dog

e.g., As one of the functions for security application, it contributes to building a security system like issuing an alarm when cameras detect persons near cars.

Please contact Renesas sales for demonstration requests.