

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.

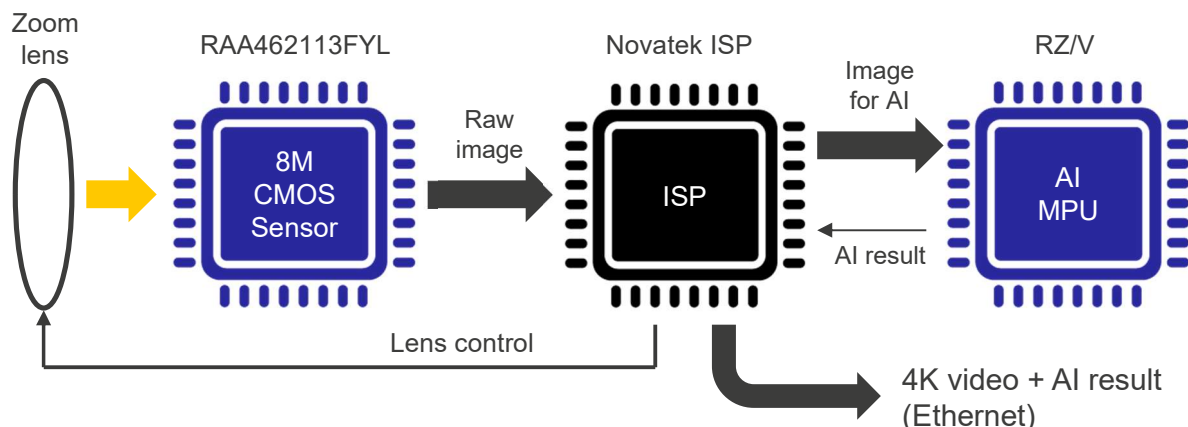
- Development period of hardware by utilizing PCB design information
- Development period of AF software by utilizing AF sample software
- Design period of AI model design by utilizing AI application^{*6} from RZ/V partners

*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



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

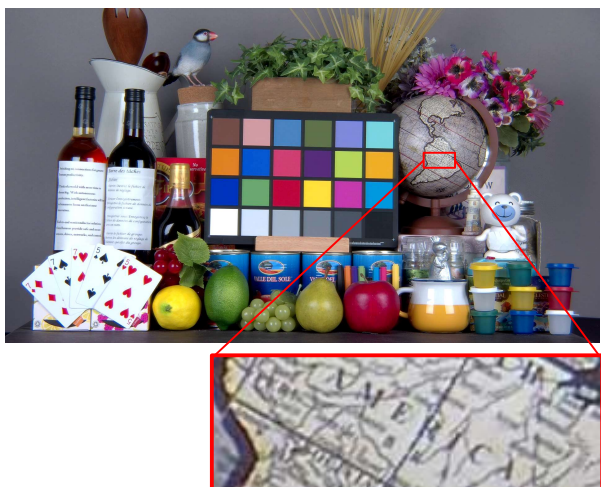
Main spec. of camera module for evaluation

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

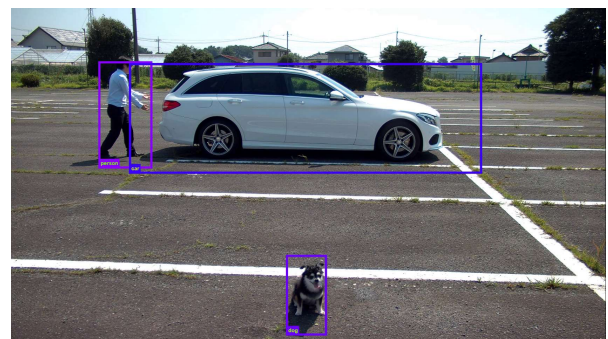
- Imaging example for studio set

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.