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.


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


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

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

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

  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.