Ci1

Image Signal Processor for Car Sensing and Viewing

The iCatch Ci1 is an advanced image signal processor (ISP) solution that is dedicated to automotive camera module applications. It integrates a number of high-quality image processing blocks to support high dynamic range (HDR) processing, fisheye lens de-warping, and motion compensated video noise filtering in automotive environments. For distant transmission, Ci1 supports external serializer/deserializer or analog HD transmitter/receiver through MIPI or Parallel interface. Combining with dual sensor input capability, these features make Ci1 a flexible solution to be placed either in camera module or in ECU to save space and cost.

Ci1 also integrates a neural processing unit (NPU) to enable edge intelligence in camera module directly. This NPU block can help the camera module detect objects on the road, such as pedestrians, vehicles, cyclists, lane marks, and traffic signs. These features make Ci1 very suitable for intelligent rear-view camera (RVC), blind spot detection (BSD) camera, driver monitor system (DMS) camera, and other similar applications. Combining the advanced ISP functions with the intelligent NPU computation, Ci1 not only can provide excellent video for viewing, but also can off-load host ECU for a more effective and efficient system solution.

FEATURES

Image Sensor Interface
- 10-lane MIPI, sLVDS, HiSPi serial interfaces
- Support dual image sensor inputs
- Support RGB Bayer and RGB-IR color filter array

Advanced Image Processing
- Pixel processing speed up to 140M pixels/sec
- Motion compensated temporal noise filtering for video
- Multi-exposure HDR video
- Lens distortion correction (LDC) and dewarping engine
- On-the-fly bad pixel correction
- Multi-channel lens color shading correction
- 3D LUT color correction

Processor Cores
- Arm Cortex-A7 CPU, frequency up to 720MHz
- iCatch proprietary image processing pipeline and acceleration engines
- NPU with computing power up to 0.3TOPS (INT8)

OSD Overlay and Video Output Interface
- Alpha blending OSD up to 2 layers in RGB888
- MIPI CSI output interface
- BT.601/656/1120 digital interface

Peripherals
- Support 4-bit SPI-XIP flash memory
- GPIO, PWM, UART, SPI and I2C ports
- 1-channel 10-bit SAR ADC
- USB2.0 device controller with on-chip PHY
- Voltage and temperature sensors

Package
- LFBGA 144, 8 mm x 8 mm x 1.6 mm
- AEC-Q100 Grade 2 (-40°C to 105°C)
DEVELOPMENT PLATFORM

The Ci1 Camera Development Platform includes SBC (Single Board Camera) board, software development kits and documentation. The users can develop their advanced imaging and video solutions with various networking capabilities.

Hardware
- Ci1 SBC board
- Sensor boards with Sony, OmniVision and ON Semi CMOS sensors
- LCD display board

Software Development Kit
- Libraries for ISP, 3A, NDK, RTOS
- WiFi connected camera application reference design source code
- PC tool chain of programmer, and font and string generator
- Android/iOS APP SDK for mobile phone connection

Documentation
- User's manual for SBC board, application notes, and API documents
- Data sheet, schematics and layout files