DR1152

Digital Image processor for 4-COLOR CMOS Sensor with improved dual aperture technology

Product Brochure — November 2016

Introduction

The DR1152 is a special SoC that generates depth map with a single camera using Dual Aperture sensor technology, without an additional component for IR (infrared) emission. It can work with a 4-color image sensor or a 3-color sensor.

The DR1152 includes the ARM Cortex-M3 core, up to 128 KB of on-chip SRAM, an IPSS (Image Processing Subsystem) composed with DMP (Depth Map Processing), JPEG and ISP, a state configuration timer-subsystem, three SPI supports, two MIPI interfaces, a High-speed USB controller, an external memory controller and multiple digital and analog peripherals.

Key Features

32-bit ARM® Cortex™-M3 CPU

- Up to 100 MHz operation frequency
- Built-in Nested vectored interrupt controller (NVIC) for fast deterministic interrupt processing
- Wake-up Interrupt Controller (WIC) allows automatic wake from any priority interrupt
- 3 Low-power modes (Sleep/Deep-sleep/Standby)

Memories

- 128 KB on-chip SRAM
- 8 KB internal ROM.

IPSS (Image Processing Subsystem)

Image Processing Subsystem consist of Depth Map Processor (DMP), JPEG encoder and In-System Programming (ISP).

Peripherals

- Two 2-channel Direct Memory Access (DMA) controllers
- Windowed Watchdog Timer
- Two UARTs
- Three 16-bit Serial Peripheral Interfaces (SPI)
- Four I^2C modules
- Two I2S modules
- Up to 64 Fast GPIO pins
- Two MIPI interfaces (RX/TX)
- High-speed USB2.0 controller

Core Supply Voltage

- 1.2V

IO Voltage

- 1.8V~3.3V

Package Information

- 121-pin BGA
- Ball Pitch: 0.5 mm
- Package Width x Length: 6 mm x 6 mm

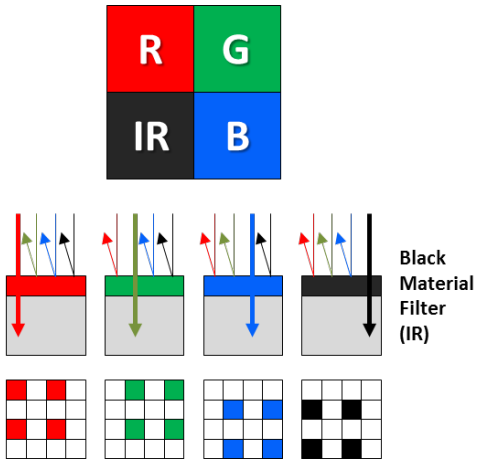
More Specification

Features		Specification
Depth Map		
	Resolution	640×480 @ 60fps 1024×768 @ 30fps
	Depth Level	121 + 1 (8 bits)
	PSF Kernel Size	Max. 25x25 (max depth range: up to ~2m)
	Depth Step	As small as 0.4mm (with near-range supported optics)
	PSF Type	Binary (Synthetic)
	Algorithm enhancement	Blur Channel Depth Combining, Edge Thinning, Depth Noise Reduction
Sensor Interface		MIPI CSI2 RX (PHY+Link) Parallel I/F (3~5MP)
RGB resolution		2,048 x 1,536 (Hi-231)
ISP		• AE, AWB • 2D NR, LSC (RGB & IR) • Color Correction, Gamma Correction, etc.
CPU Core		ARM® Cortex M3
Peripheral I/F		• USB2.0 (PHY+Link) • MIPI CSI2 TX (PHY+Link) • Parallel I/F • I^2C, SPI, UART
Process Tech.		55nm LP (Fujitsu)

Technology

4-color Sensor

The DR1152 is unique in that it does not require an IR emitter. It obtains IR and RGB information from the ambient scene in a "passive" way, from a 4-color sensor. This leads to a more efficient, smaller and lower cost design for depth processing applications. Another benefit to this technology is that it will work for out-door activities where an IR emitter is ineffective due to the background IR that is present.

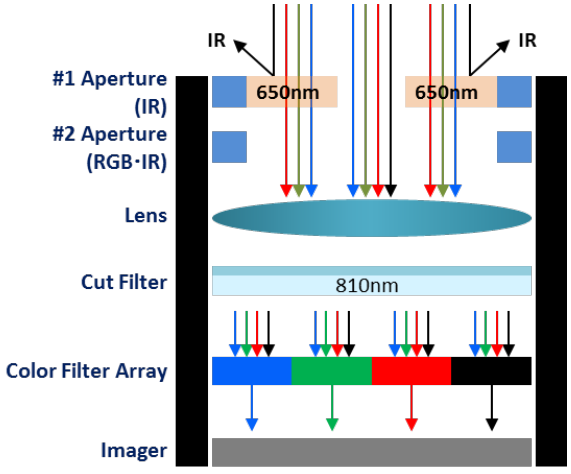


The SoC can also support 3-color sensors.

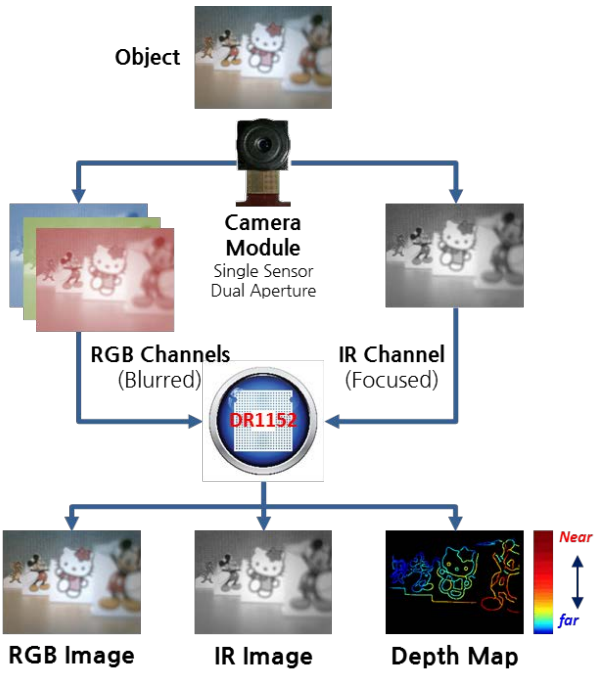
Dual Aperture takes focused IR and blurry RGB

The amounts of RGB and IR are controlled through the filters in the lens barrel.

Relative distance information is calculated by comparing the focused IR and the blurred RGB images, with convolution by the PSF matrix.



How DMP Works



Applications

- Embedded notebook, netbook, and desktop monitor cameras
- Game consoles
- Automobile dashboard control
- Cell phones, mobile devices, and consumer video

For more information, please visit: http://www.e-wbm.com.
For sales inquiries, please email to: info@e-wbm.com