

NEC Electronics Introduces Super-Resolution ASSP to Sharpen Full HD Image and Video Quality

DUESSELDORF (Germany), KAWASAKI (Japan), SANTA CLARA, Calif. (U.S.A.), May 28, 2009 – NEC Electronics today announced its new super-resolution application-specific standard product (ASSP), the uPD9280GM, that can reduce blurring that occurs when low-resolution images and video are expanded and displayed in 1920 x 1080-pixel high-definition (HD) monitors.

Based on the company's unique single-frame super-resolution technology, the new ASSP achieves crisp images in HD TV broadcasts by boosting 720 x 480-pixel standard definition (SD) image data. It is also capable of supporting one billion colors (30-bits color depths), which enhances color vividness and accuracy of display. The rapid development of today's high-performance digital audio/visual (AV) devices, such as mobile phones and digital TVs, has left consumers with the challenge of how to view low-resolution images on their new high-definition electronic products. For example, 1920 x 1080-pixel HD televisions have six times the resolution compared to the 720 x 480-pixel SD image data, which results in blurred images.

Although many image-enhancement technologies have been developed to process low-resolution image data into full HD images, designers, using traditional solutions need large-capacity external memory devices and high-performance compute engines, and face other challenges to achieve real-time processing for vivid moving images. To solve these problems, NEC Electronics and NEC Central Research Laboratories jointly developed a new technology that enables very high-resolution processing with just one frame of image data. In November 2008, NEC Electronics announced the first super-resolution ASSP (part number uPD9245GJ) for HD image processing, which has been gaining popularity in the market. To address the demand for full HD image processing, the company now offers the new uPD9280GM super-resolution ASSP.

Three key features of the uPD9280GM super-resolution ASSP are:

(1) Enhances SD video and image data for crisp display in full HD

With increased operating frequency of 150 megahertz (MHz), compared to the previous 108 MHz, this improved operating frequency supports advanced processing of image data and

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boosts images with higher resolution even on full HD television broadcasts. The super-resolution technology is also available as an intellectual property (IP) core.

(2) Capable of displaying one billion colors

The new ASSP extends its color quality from 24-bit color supporting 8 bits per component of red, green, and blue (RGB) color, to 30-bit color. While 24-bit color is only capable of displaying 15 million colors, 30-bit color (aka Deep Color *Note) can display one billion possible colors with smooth color gradation.

(3) No need for external memory

Conventional image-resolution technologies used a multiframe technique to process image data, which required large-capacity external memory making it expensive and difficult to create hardware capable of real-time processing. NEC Electronics' super-resolution technology enables high-resolution processing with just one frame of image data. Reducing the processing load eliminates the need for expensive, external high-capacity memory.

NEC Electronics expects this new ASSP will help to better archive valuable images, data and memories previously recorded with only low-resolution technology in various applications, from security camera and automotive backup camera to medical endoscope. The company plans to continue developing super-resolution system-on-chips (SoCs), by leveraging its super-resolution IP cores that can be embedded into ASICs or other ASSP products, such as NEC Electronics' Enhanced Multimedia Architecture (EMMA™) and image-signal processors for mobile phones, the Camera Engine series. With this wide range of products, the company intends to continue to enhance the super-resolution lineup and plans to reach sales revenue of 10 billion yen in 2010.

Main specifications of NEC Electronics' μ PD9280GM super-resolution ASSP can be found in the attachment.

Availability

Samples of NEC Electronics' μ PD9280GM super-resolution ASSP are available now. Mass production is scheduled to begin in July 2009, starting from 100,000 units per month, expecting to reach approximately 1,000,000 units by 2010. More information can be found at

<http://isspc13.stf.necel.com/superresolution/en/index.html>

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Super Resolution Technology Demonstration at SID Display Week 2009

NEC Electronics super-resolution technology will be showcased in NEC Electronics America's booth #459 at the Society of Information's (SID) Display Week 2009 conference at the Henry B. Gonzalez Convention Center in San Antonio, Texas, June 2-4.

(Note) Deep Color: a term used to describe a method of representing graphical image data using an excessively large number of shades, which was difficult to represent using 24-bit color (16 million colors). The HDMI 1.3 specification or later version supports Deep Color bit depths and it defines bit depths for Deep Color as greater than 24-bits.

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About NEC Electronics Corporation

NEC Electronics Corporation (TSE: 6723) specializes in semiconductor products encompassing advanced technology solutions for the high-end computing and broadband networking markets; system solutions for the mobile handset, PC peripheral, automotive and digital consumer markets; and multi-market solutions for a wide range of customer applications. NEC Electronics Corporation has subsidiaries worldwide including NEC Electronics America, Inc.

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>>> Attachment <<<

Product Specifications of NEC Electronics' μ PD9280GM Super-Resolution ASSP

- Based upon NEC Electronics' single-frame super-resolution technology algorithm
- Maximum Resolution: WUXGA (1920 x 1200 pixels)
- Video Interface: 30-bit CMOS I/O
- Video Data: RGB or YUV
- External memory: no external frame memories are required
- Host Interface: I2C slave
- Maximum Operating Frequency: 150 MHz
- Silicon Process: 0.15 μ m CMOS technology
- Power Supply Voltage: 3.3 V for I/O, 1.5 V for core
- Package: 176-pin LQFP (24x24 mm body, 0.5 mm lead pitch)