

## **Multi-view 2D/3D display provides enhanced stereoscopic viewing experience**

KAWASAKI, JAPAN, SANTA CLARA, Calif., DUSSELDORF, Germany, May 14, 2012 --- NLT Technologies (NLT), together with its sales and marketing channels in the Americas and Europe, Renesas Electronics America and Renesas Electronics Europe GmbH, today announced the successful development of a new autostereoscopic multi-view display with HxDP (Horizontally x times-Density Pixels) technology. The low-temperature polysilicon thin-film-transistor (TFT) color liquid crystal display (LCD) 2D/3D module prototype features a wide quarter video graphics array (WQVGA) resolution that enables autostereoscopic images.

Incorporating NLT's proprietary HxDP pixel array, the 3.1-inch (79 millimeters diagonal), six-view display prototype enables users to view high-density stereoscopic images without special 3-dimensional (3D) glasses. The prototype also features a wide stereoscopic viewing angle and NLT's multi-view technology with multi-camera data, which allows users to see multi-angle images with smooth motion parallax, providing a more realistic 3D viewing experience. The 3.1-inch HxDP module will be on display in the Renesas Electronics America booth (#343) at Display Week 2012 at the Boston Convention and Exhibition Center, June 5-7.

"As interest in 3D technologies increases for consumer and industrial markets, there is a growing need to support both two-view and multi-view technologies and products, particularly for applications like 3D CAD/CAM, gaming or medical imaging," said Omid Milani, Vice President, Displays, Renesas Electronics America. "Applying advanced technologies like NLT's HxDP technology to industrial applications helps to create a more comprehensive user experience and improve overall results by providing more accurate and realistic imaging capabilities."

3D-based movies, TV, and mobile phones have been gaining popularity worldwide, but most are based on two-view technology, which is adequate for traditional broadcasting and TV systems. However, autostereoscopic displays can support multiple views, which provides a more natural 3D viewing experience.

NLT's HxDP technology is an advancement to the company's HDDP (Horizontally Double-Density Pixels) technology designed to enable multi-view stereoscopic displays for use in a variety of industrial applications, such as 3D CAD/CAM, medical, gaming and mapping/topography.

Conventional LCDs are based on square pixel arrangements, with RGB sub-pixels distributed in vertical stripes with two pixels required to display a 3D image, cutting the display's horizontal resolution in half. With NLT's HxDP technology, the six-view, 2D/3D 3.1-inch display prototype module is composed of horizontally striped RGB color pixels, each consisting of three sub-pixels that are striped horizontally and split in 1/6 lengthwise, resulting in a resolution six times that of 3D LCD modules

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constructed with vertically striped pixels. Alternating displays of the horizontal pixels for each eye produces the desired 3D images. The HxDP technology also makes it possible for 2D and 3D images to be displayed simultaneously in the same resolution on the same screen without the need for 3D glasses.

One common issue with 3D displays is 3D cross talk, which occurs when the human visual system mixes left-eye and right-eye information, causing the 3D effects to be limited or decreased. NLT's new HxDP 3D technology results in displays with reduced levels of overall 3D cross talk and a wide 3D viewing area, allowing easy viewing of the images.

The new HxDP LCD module is a result of NLT Technologies' research and development efforts to produce higher 3D image quality that complements the company's existing HDDP family, including a 2.5-inch 3D LCD HVGA module and also NLT Technologies' 7.2-inch SVGA HDDP 3D LCD module currently in production. NLT Technologies continues to promote research and development of 3D displays, and aims to expand its 3D product lineup in addition to the development of new applications for the company's primary markets to support evolving multi-view needs from customers in these industrial markets.

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