

World's Highest Resolution 3D Images

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NEC Corporation today announced that it has succeeded in the development of a novel 3D system-on-glass ("SOG") liquid crystal display ("LCD") that can display the world's highest resolution 3D images. NEC's original Horizontally Double-Density Pixel ("HDDP") structure breaks the conventional LCD resolution barrier, and combined with a lenticular-lens enables the world's highest 3D display resolution of up to 235ppi.

The features of this 3D SOG LCD are as follows:

A 470ppi (horizontal) X 235ppi (vertical) pixel resolution in 2.5inch diagonal and 640 X 480 pixel VGA format has been achieved through NEC's own HDDP structure. Each pixel is of rectangular shape with horizontally striped color sub-pixels. This design doubles the horizontal resolution of conventional LCDs.

Brighter and higher resolution 3D view, as compared with conventional 3D LCDs, has been achieved by fully utilizing the HDDP/lenticular-lens combination. Boasting a thin and simple structure, no special glasses are required for 3D viewing.

2D or 3D is selectable, depending on the contents for display, enabling simultaneous display of 2D and 3D pictures with arbitral sizes and shapes in the same picture/screen.

This technology greatly improves 3D LCD resolution by up to 235ppi in 3D format, as compared with a 90ppi resolution on a mobile phone utilizing a conventional 320 X 240 pixel QVGA 180ppi 2D display. Through application of this technology attractive mobile equipment with simultaneously bright 3D view and high quality 2D image (such as photo



and e-mail) display is achieved.

Although interest in 3D display without special glasses is growing along with the improvement of mobile equipment functionalities, conventional 3D display still has many challenges. For e.g., a 3D display needs to display more than two pictures for the right and left eye separately, and as one 3D pixel needs at least two adjacent pixels horizontally, effective horizontal 3D resolution is halved as compared with that of the vertical. Lower brightness in 3D display mode as compared with 2D mode, which occurs in some 2D/3D convertible displays, is another issue.

NEC has solved these problems with its 3D SOG LCD, which utilizes a HDDP/lenticular-lens combination. In the HDDP structure, pixels have a rectangular shape as compared with square pixels in conventional displays. This pixel shape doubles the horizontal resolution to 470 ppi as compared with conventional displays. 2D pictures are displayed by sending the same contents to two adjacent pixels resulting in a 235ppi high quality 2D view. 3D picture is shown by sending two pictures for the left and right eye to two adjacent pixels also resulting in 235ppi 3D view, the same resolution as that of 2D view.

This achievement was announced at Asia Display/IMD'04, which was held from August 23 to 26, 2004, in Daegu, Korea. NEC will continue to further develop this new 3D SOG LCD technology to extend mobile equipment capability.

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