

## **Hitachi Releases HD66777, Providing 262,000-Color Display plus Main and Sub LCD Panel Drive with a Single Chip, for TFT Color Liquid Crystal Display System of Mobile Phones**

— Faithful display of camera images plus reduction in number of parts through single-chip implementation, for smaller, thinner liquid crystal panel modules at approximately 25% lower cost —

Tokyo, March 10, 2003 — Hitachi, Ltd. (TSE: 6501) today announced the HD66777, supporting a 262,000-color display and simultaneous driving of a main (132 × 176-pixel) and sub (132 × 96-pixel) liquid crystal screen with a single chip, for a TFT color liquid crystal display system of digital mobile phones and similar products. Hitachi is simultaneously releasing the HD66785, supporting a 262,000-color display and driving of only a main (132 × 176-pixel) liquid crystal screen with a single chip. Sample shipments of both products will begin on March 11, 2003 in Japan.

Recently, digital mobile phones are featuring multicolor displays for displaying still and moving pictures, camera images, and so on. However, with the higher pixel counts of the latest cameras built into mobile phones, there is a need for high-image-quality displays exceeding the mainstream 65,000-color standard in order to provide more faithful display of images such as photographs. Meanwhile, folding-type mobile phones generally include a sub liquid crystal display for incoming call information and the like. However, there is a growing trend for photographic images to be displayed by these sub LCDs also, creating a demand for the same kind of high image quality as provided by the main display. At the same time, mounting space in mobile phones is limited. Therefore there is need to device for efficient mounting in a small area, and enabling lower system costs.

Hitachi has developed the HD66777 and HD66785 to meet these demands. Both these products are for amorphous TFT color liquid crystal display system, providing 262,000-color display with a single chip. The HD66785 supports a 132 × 176-pixel screen size, and the HD66777 supports a 132 × 272-pixel screen size.

The HD66777 enables a 132 × 272-pixel area to be divided into areas of any desired size to provide main and sub liquid crystal displays, and can drive the main and sub displays either simultaneously or independently. For example, a 132 × 176-pixel main display can be used with a 96 × 96-pixel or 132 × 96-pixel sub display, to provide a display configuration that meets the user's requirements.

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A single liquid crystal driver can thus handle both main and sub liquid crystal displays in place of the two drivers currently required, enabling the mounting area to be halved and external parts to be shared, making it possible to halve the number of parts and so create a smaller, thinner liquid crystal panel module while cutting the module cost by approximately 25%.

The HD66777 also includes moving-picture application support functions such as alpha-blending for transparent display of a background screen, and on-screen display that simplifies text and icon display in moving-image data, allowing easy moving-image data processing. These features facilitate use of the sub display as a built-in camera monitor and for playback of moving-image content, in addition to its current standard function of still-picture display.

Power consumption at standby display of mobile phone, including that of the panel, is 0.8 mW or less, equivalent to that of a color STN liquid crystal panel, helping to extend the standby time.

The HD66777 and HD66785 also incorporate a high-speed burst RAM write function for writing to display RAM, enabling processing at a maximum speed of 160M bps (bits per second). This function makes possible the writing of large-volume data such as color image data, and high-speed rewriting of display RAM contents for performing moving-image display, enabling smooth moving-picture display to be achieved.

The COG\*<sup>1</sup> mounting method is supported, in which the device is directly mounted face-down on the LCD glass.

Hitachi plans further expansion of the product lineup in the future in response to market needs.

Note: 1. COG (Chip On Glass): A mounting method in which a chip with gold bumps is directly mounted face-down on the LCD glass substrate.

#### < Typical Applications >

- Mobile camera-phones handling moving-image mail and WWW content services
- Mobile phones supporting moving-image display (W-CDMA, GPRS, etc.)

#### < Prices in Japan > (For Reference)

Product Code	Shipment Form	Sample Price (Yen)
HD66777 (HCD667B77BP)	Chip with gold bumps (zigzag pad arrangement)	2,200
HD66785 (HCD667B85BP)	Chip with gold bumps (zigzag pad arrangement)	1,900

<Specifications>

**(1) HD66777**

<b>Item</b>	<b>Specifications</b>
Display size	132 × 272 pixels <ul style="list-style-type: none"><li>Divisible into main and sub liquid crystal displays of any size</li></ul> Example: 132 × 176-pixel main display plus 132 × 96-pixel sub display
Display colors	262,000 colors ( incorporating a high-speed burst RAM write function )
Number of outputs	396 source outputs, 272 gate outputs
Display RAM size	80,784 bytes
Display functions	<ul style="list-style-type: none"><li>adjustment function settable independently for main and sub displays</li><li>On-screen display</li><li>50% transparent alpha-blending display</li><li>8-color display mode</li><li>Ultra-high-frequency refreshing by interval scanning</li></ul>
Logic power supply voltage	2.4 V to 3.3 V
Interface I/O voltage	1.8 V to 3.3 V
Step-up circuit	5× to 9× plus polarity inversion
Liquid crystal drive voltage	Source side: 4.5 V to 5.5 V Gate side: +/-9.0 V to +/-16.5 V
Shipment form	Chip with gold bumps (for COG mounting)

**(2) HD66785**

<b>Item</b>	<b>Specifications</b>
Display size	132 × 176 pixels
Display colors	262,000 colors ( incorporating a high-speed burst RAM write function )
Number of outputs	396 source outputs, 176 gate outputs
Display RAM size	52,272 bytes
Display functions	<ul style="list-style-type: none"><li>External synchronization display mode</li><li>8-color display mode</li></ul>
Logic power supply voltage	2.4 V to 3.3 V
Interface I/O voltage	1.8 V to 3.3 V
Step-up circuit	5× to 9× plus polarity inversion
Liquid crystal drive voltage	Source side: 4.5 V to 5.5 V Gate side: +/-9.0 V to +/-16.5 V
Shipment form	Chip with gold bumps (for COG mounting)

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.

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