Hitachi Releases HD66778 492/360-Output, 64-Grayscale TFT Driver with On-Chip Timing Control Circuit for HVGA and QVGA Definition TFT Liquid Crystal Panels for Use in PDAs

— 1.35 mm chip width allowing compact mounting, plus an on-chip timing control circuit that reduces the number of parts required, enabling system costs to be reduced —

Tokyo, September 26, 2002— Hitachi, Ltd. (TSE: 6501) today announced the HD66778 TFT liquid crystal driver, with switchable 492/360-output capability and supporting 64-grayscale, 260,000-color display, as a source driver for 3- to 4-inch HVGA*[1] and QVGA*[2] definition TFT liquid crystal panels used in PDAs (Personal Digital Assistants). Sample shipments will begin in October 2002 in Japan.

The HD66778 features a chip width of only 1.35 mm that enables compact mounting. In addition, the inclusion of an on-chip timing control circuit, previously provided as an external dedicated LSI, enables the number of parts to be reduced, for compact mounting and lower-priced end-products

Portable information terminals known as PDAs have recently been offering featuring greater functional versatility and higher performance, while offering lower power consumption in order to extend battery life. Also, in order to achieve a compact end-product, a configuration comprising a main CPU with built-in LCD controller together with driver chips is generally employed for liquid crystal panel control, and there is a need to further reduce the mounting area of the liquid crystal display driver as well as lowering product power consumption.

To meet this need, Hitachi has developed the HD66778, supporting switchable 492/360 outputs and 260,000 colors at 64-grayscale, designed to offer lower liquid crystal panel power consumption and a more compact mounting area. Major features of the HD66778 are summarized below.

< Features >

1. Compact chip size supporting switchable 492/360 outputs and 260,000-color display
   Hitachi's well-established TFT liquid crystal source driver for notebook PCs has undergone design optimization for PDA use in terms of the liquid crystal drive capability of driver output characteristics adjustment circuitry, supporting notebook PC equivalent 260,000-color display at low power consumption. In addition, 492/360 output switching enables HVGA (320 × 480-dot) and QVGA (240 × 320-dot) definition standards each to be supported with two chips, and the small chip size of 18.90 mm × 1.35 mm makes it possible to reduce the LCD panel dimensions around the display area, in which the chip is mounted, enabling the overall LCD panel size to be decreased.

2. Fewer parts needed thanks to on-chip timing control circuit
   The HD66778 includes an on-chip programmable display timing control circuit. In order to perform supplementary adjustment of TFT characteristics that differ from panel to panel, processing for fine adjustment of TFT liquid crystal panel internal gate timing and source data write timing has previously been handled by a dedicated external LSI based on display data transfer signals from the display controller. Including this timing control circuitry on-chip has eliminated the need for this external LSI, making it possible to cut costs by reducing the number of parts, and to create a thinner LCD panel.
   In addition, an on-chip 35 V high-withstand-voltage level-shifting circuit for the gate driver interface is included that supports amorphous TFT technology incorporating gate drivers, enabling a further reduction in the number of external parts.

3. Higher-quality display capability through support for border color display function
   The HD66778 supports a border color display function that displays a border of a specific color around the display area. The border color can be varied according to the background color of the display characters, providing a higher-quality display that is easier on the eyes.

The supported mounting method is COG*[3] mounting, in which the device is directly connected face-down on the LCD glass substrate. In addition, for the pin arrangement inside the LSI, common drivers are arrayed at both sides of the segment driver area, allowing compact mounting through a central arrangement that enables balanced wiring at both sides of the LCD display unit.

Hitachi plans to further extend the product lineup in the future with the development of models capable of handling a variety of display screen sizes.

Notes: 1. HVGA (Half size Video Graphics Array): A display definition standard offering two formats: a portrait type 320 × 480-dot format and a landscape type 640 × 240-dot format.
2. QVGA (Quarter size Video Graphics Array): A display definition standard of 240 × 320 dots.
3. 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 >

- PDAs handling e-mail and WWW content services
- Mobile phones supporting high-speed data transfer (W-CDMA, GSM)
- Handheld GPS terminals, handheld POS terminals

< Prices in Japan >(For Reference)

Product Code	Shipment Form	Sample Unit Price (Yen)
HD66778 (HCD66778BP)	Straight-array chip with gold bumps	1,300

< Specifications >

Item	Specifications
Function	64-grayscale TFT source driver (with on-chip timing control circuit)
Number of LCD drive outputs	Switchable 492/360 outputs
Power supply voltages	2.5 V to 3.6 V (logic) 3.5 V to 5.5 V (source driver) VGH-VGL: 35 V (for gate driver interface)
Operating temperature	-40°C to +85°C
Data input	18-bit RGB interface
Interface	Serial communication interface (For border color and power consumption mode setting)
Timing control circuit	Gate timing output adjustment functions • Non-overlap amount adjustment • Frame timing delay time/signal width adjustment

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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.
