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**Hitachi Releases HD66772/HD66774/HD66775/HD667P01 TFT Color LCD
Controller Driver Chip Set for Next-Generation Mobile Phones**

— Large 176 × 240-pixel screen and 262,144-color display capability
plus industry's first high-speed moving picture interface for smooth moving picture display —

Tokyo, October 11, 2001 — Hitachi, Ltd. (TSE: 6501) today announced the HD66772/HD66774/HD66775/HD667P01 graphic display LCD controller driver chip set for TFT color LCD panels installed in next-generation digital mobile phones and similar products. Sample shipments will begin in November 2001 in Japan.

This chip set supports 176 × 240-pixel TFT color LCD panels--the industry's largest class of display screen size for mobile phone use--and offers 262,144-color display capability at a low power consumption of 4.5 mW. It also incorporates a high-speed moving picture interface offering smooth moving picture display as an industry first, making it ideal for next-generation mobile phone systems and similar products.

[Background]

These days, information displayed on digital mobile phones includes still images such as photographs provided via a mounted miniature camera in addition to text and graphic information, and the trend in next-generation mobile phones is one of moving image displays capable of representing a greater variety of colors. As a result, the move in LCD panels for next-generation mobile phones is toward larger screens to handle increasing volumes of display information together with a greater color range for more realistic color representation. Meanwhile, in the area of TFT LCD construction, low-temperature polysilicon TFT LCDs offering high resolution even on screens under two inches in size have appeared on the market in addition to the amorphous TFT LCD panels that are the current mainstream type, and use of these new LCDs is expected to increase in the future. In these circumstances, there is a strong demand for LCD controller drivers that can handle low-temperature polysilicon TFT LCDs as well as supporting larger screens and a greater range of colors.

Hitachi is now releasing the HD66772/HD66774/HD66775/HD667P01 chip set for TFT color LCD panels installed in next-generation mobile phones to meet the demand for large screens, high picture quality, and moving picture display capability. The products in this chip set are as follows:

- (1) HD66772: A 528-output source driver, incorporating display buffer memory supporting 262,144 colors and a display controller
- (2) HD66774: A 240-output gate driver (incorporating a power supply circuit for LCD drive voltage generation)
- (3) HD66775: A 120-output gate driver
- (4) HD667P01: A power supply LSI for generating the LCD drive voltages supplied to the source driver and gate driver, supporting both low-temperature polysilicon TFT LCDs and amorphous TFT LCDs

[Features of the Chip Set]

(1) Supports 176 × 240-pixel large-screen display and 262,144-color display equivalent to the number of display colors of a PC.

(2) High-speed moving picture display made possible through the incorporation of the industry's first moving picture interface

The HD66772 is the main device in this chip set, incorporating a moving picture RGB direct interface that enables RGB signals to be received. This allows reception of RGB signals directly from an MPEG4 or similar graphic processing LSI, enabling high-speed display of moving picture data at 30 frames per second--equivalent to TV display--for smooth moving picture display.

(3) Combination supporting low-temperature polysilicon TFT LCDs and mounting forms enabling compact mounting

This chip set offers the three combinations shown below. Available mounting forms are COF*1 and COG*2 for the HD66772, COF for the HD66774, COF and COG for the HD66775, and COF for the HD667P01. These offer a choice of chip set combinations and mounting forms to suit various LCD panel design requirements, and allow compact mounting that makes it possible to implement a central arrangement enabling balanced wiring at both sides of the panel.

(a) Amorphous TFT LCD: HD66772 + HD66774 (COF)

Two-chip configuration for low cost and easy panel design.

(b) Amorphous TFT LCD: HD66772 (COG) + HD66775 × 2 (COG) + HD667P01 (COF)

Four chips are required, but COG mounting enables the mounting area to be reduced.

(c) Low-temperature polysilicon TFT LCD: HD66772 + HD667P01 (COF)

(4) Low power consumption equivalent to STN color LCD panel

In these products the LCD drive output circuitry has been specially devised to reduce power consumption. This makes it possible to achieve power consumption of approximately 4.5 mW, including the panel, with an amorphous TFT LCD--the same low level as with an STN color LCD panel.

Hitachi plans further expansion of the product lineup in the future, including the development of products supporting even higher definition.

- Notes: 1. COF (Chip On Film): A mounting method in which a chip with a gold bump is directly mounted face-down on a flexible film substrate.
2. COG (Chip On Glass): A mounting method in which a chip with a gold bump is directly mounted face-down on the LCD glass.

< Typical Applications >

- Mobile phones handling e-mail and WWW content services
- Mobile phones supporting high-speed data transfer (W-CDMA, GPRS, etc.)
- Small PDAs, handheld GPS terminals, handheld POS devices

< Prices in Japan > (For Reference)

Product Code	Shipment Form	Sample Price (Yen)	
HD66772	HCD667A72BP	Chip with gold bump (straight layout)	2,200
	HCD667B72BP	Chip with gold bump (staggered layout)	2,200
HCD66774BP	Chip with gold bump	840	
HCD66775BP	Chip with gold bump	320	
HCD667P01BP	Chip with gold bump	400	

< Specifications >

Item	HD66772 Specifications
Display size	176 × 240 pixels, 262,144 colors
Number of outputs	528 source outputs
Display RAM size	95,040 bytes
Display functions	<ul style="list-style-type: none"> • Window address function (rectangular RAM address area writing) • Dual-screen partial display function (screen division at arbitrary line)
Bit operation functions	<ul style="list-style-type: none"> • Write data mask function (bit units) • Bit operation function (pixel units)
LCD drive duty	1/16 to 1/240 (programmable in 8-line units)
Interfaces	80-type 8/9/16/18-bit bus High-speed moving picture interface: 6/16/18 bits Synchronous serial interface support Gate power supply dedicated serial interface
Write cycle	100 ns (3V power supply voltage)
Logic power supply voltage	1.8 V to 3.3 V
LCD drive voltage	4.5 V to 5.5 V
Shipment forms	<ul style="list-style-type: none"> • Chip with gold bump (for COF or COG mounting)

Item	HD66774 Specifications
Number of outputs	240 gate outputs
Interface	Dedicated serial interface
Logic power supply voltage	1.8 V to 3.3 V
LCD drive voltage	±9 V to ±16.5 V
Step-up circuit	5× to 9× + polarity inversion Source power supply output: 4 V to 5 V Gate power supply output: ±9 V to ±16.5 V
Shipment forms	<ul style="list-style-type: none"> • Chip with gold bump (for COF mounting) • Custom TCP

Item	HD66775 Specifications
Number of outputs	120 gate outputs
Interface	Dedicated serial interface
Logic power supply voltage	1.8 V to 3.3 V
LCD drive voltage	± 9 V to ± 16.5 V
Shipment forms	<ul style="list-style-type: none"> • Chip with gold bump (for COF or COG mounting) • Custom TCP

Item	HD667P01 Specifications
Interface	Dedicated serial interface
Logic power supply voltage	1.8 V to 3.3 V
Step-up circuit	5× to 9× + polarity inversion Source power supply output: 4 V to 5 V Gate power supply output: ± 7 V to ± 16.5 V
Shipment forms	<ul style="list-style-type: none"> • Chip with gold bump (for COF mounting) • Custom TCP