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Customer Inquiries
Information Technology R&D Center
Mitsubishi Electric Corporation
Fax: +81-467-41-2142

Media Contact
Public Relations Division
Mitsubishi Electric Corporation
Tel: +81-3-3218-3380
prd.gnews@nk.MitsubishiElectric.co.jp
<http://global.mitsubishielectric.com/news/>

MITSUBISHI ELECTRIC DEVELOPS HIGH-SPEED AND COMPACT IP CORE FOR PROCESSING GRAPHICS IN BUILT-IN DISPLAY SYSTEMS

Tokyo, February 10, 2009 – Mitsubishi Electric Corporation (President and CEO: Setsuhiro Shimomura) (TOKYO: 6503) announced today that it has developed a high-speed and compact intellectual property (IP) core for graphical user interfaces (GUI), to be used in built-in display systems for operating a variety of equipment. With this development, the text used in displays for operating purposes will be clearer and easier to distinguish, and response time will be quicker when displaying graphics and other applications.

Background and Summary of Development

More and more types of equipment incorporate liquid crystal display panels for use in operation and for displaying operational instructions. Recently, demand is also increasing for displays that have smoother and clearer rendering capabilities and a quick response, as in the latest computer screens.

In order to show text and images on built-in display systems as clearly as on computer screens, these systems need either a CPU or a graphic display capability with a hardware processing capacity as high as that of a computer. To date, however, there were limitations to the maximum size and power consumption of built-in display systems, which kept these systems from being supplied with sufficient processing memory. As a result, text and graphics were usually processed using bitmap, making it difficult, due to slow response, to show various kinds of graphics and text clearly and at a given size.

Mitsubishi Electric has now succeeded in developing a high-speed and compact IP core for GUIs, to be used in built-in display systems. Mitsubishi Electric's original high-speed drawing algorithm enables this IP core to render text so that it is clearer and easier to distinguish, and to display graphics clearly with quick response and independent from their resolution. This technology enables built-in display systems to quickly display information on screen with universal-design visibility and readability.

Major Development Results

1) High-quality text rendering IP core for processing graphics

Mitsubishi Electric has developed an IP core that can process the Saffron Type System, a software technology developed by Mitsubishi Electric Research Laboratories to render clear and smooth outlines of text, even in a computer with a low memory capacity. This hardware also supports stroke font, which reduces the memory capacity needed per each font type to one-fourth that of previous outline fonts. In addition, with its rendering technology to optimize text depending on its shape, this IP core enables high-speed rendering of up to 80,000 Japanese TrueType font 48ppem texts per second when measured at 66MHz.

2) High-speed vector graphics processing IP core

Mitsubishi Electric has also developed 'Sesamicro,' a high-speed vector graphics processing IP core, using the company's unique high-speed drawing algorithm which enables high-quality rendering. Sesamicro uses little CPU processing power to process graphics, thus enabling the IP core to show graphics on built-in displays with a CPU operating frequency of approximately 50MHz at a higher speed than a computer fitted with a 2GHz CPU.

3) Compact circuit facilitates low-cost use in FPGAs and LSIs

The compact logic circuit, optimized to fit the drawing algorithm, has a minimum gate count of 100 kilo gates. This development makes the IP core small enough to incorporate it at a low cost in field programmable gate arrays (FPGA) and LSIs made for built-in display systems.

- **Future developments:** Mitsubishi Electric plans to widely utilize this graphics IP core in equipment for railroad transportation, factory automation, in-car display systems, audiovisual systems and a variety of other fields.
- **Patents:** There are 9 patents pending in Japan and 21 overseas.
- **Trademarks:** 'Saffron' is a registered trademark of Mitsubishi Electric. The company is also applying to register the trademark for 'Sesamicro.'

About Mitsubishi Electric

With over 80 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. The company recorded consolidated group sales of 4,049.8 billion yen (US\$ 40.5 billion*) in the fiscal year ended March 31, 2008. For more information visit <http://global.mitsubishielectric.com>

*At an exchange rate of 100 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2008

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