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MITSUBISHI ELECTRIC DEVELOPS INDUSTRY'S THINNEST 2 MEGAPIXEL CCD CAMERA MODULE

TOKYO, July 13, 2004 – Mitsubishi Electric Corporation (President and CEO: Tamotsu Nomakuchi) has developed a 2 megapixel CCD camera module which is a mere 7.42mm wide, making it the industry's thinnest (as of May 30, 2004). Sample shipments will be available during July 2004, at a unit price of 15,000 yen (FOB Japan), while mass production will start in September 2004.

As the domestic Japanese and overseas markets for mobile phones with cameras continues to grow, so too do the camera's megapixel capacities. In order to increase megapixel capacity and enable mobile phone handsets to be made thinner, we used the technological expertise and know-how gained from our module development to date to achieve the industry's thinnest 2 megapixel CCD camera module.

The module features an advanced optical design and the latest mounting technology. The "super CCD honey cam" (registered trademark of Fuji Photo Film, Inc.) makes it highly sensitive and capable of producing high quality images, even in dark places with low illumination. The CCD image sensor, power supply and signal processing LSI were all integrated into the module, reducing the space it requires in the mobile phone handset and allowing the handset to be thinner. The 2 megapixel CCD camera module is of the same size and interface as the Mitsubishi Electric 1.3 megapixel CCD camera module, providing customers with greater choice, depending on their requirements.

Each individual module allows for fine control of the AE (automatic exposure) and AWB (automatic white balance) functions. The shutterless camera is highly smear-tolerant¹,

and reproduces color in a natural and lifelike manner. Selection of an 8-bit or 16-bit digital interface² is also possible, plus the flexible printed circuit (FPC) can be customized in accordance with the customer's wishes.

1: Smear: luminescence that may appear in the upper and lower extents of the photo when photographing a bright object.

2: Digital interface: in the format of an image data output the digital interface is Y:Cb:Cr4:2:2, where Y is luminosity and Cb and Cr represent color difference data.

Fig. 1: Main Specifications

| Item | Specification |
|-------------------------------|--|
| Model Name | CM041 |
| Specification image sensor | CCD image sensor |
| Optical size (inches) | 1/3.8 type super CCD honey cam |
| Number of recorded pixels | 1616 x 1212 (2 million) |
| Pixel size (micrometers) | 3.25 x 3.25 |
| Power supply | 3.6V/2.9V/1.8V |
| Module dimensions (h x l x w) | 11.1mm x 21.8mm x 7.42mm |
| Power consumption | 290mW |
| Lens composition | Three pieces |
| Frame rate | 20 fps |
| Major functions | <ul style="list-style-type: none"> - automatic exposure - automatic white balance adjustment - output picture size adjustment - color interpolation, gray level correction - color difference matrix conversion - degree compensation of image quality - defective pixel compensation |
| Additional features | <ul style="list-style-type: none"> - macro function - single module contains an electric wave and signal processing LSI |

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 (TSE: 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 3,309 billion yen (US\$31.2 billion^{*}) in the year ended March 31, 2004. For more information visit <http://global.mitsubishielectric.com>

^{*}At an exchange rate of 106 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2004.