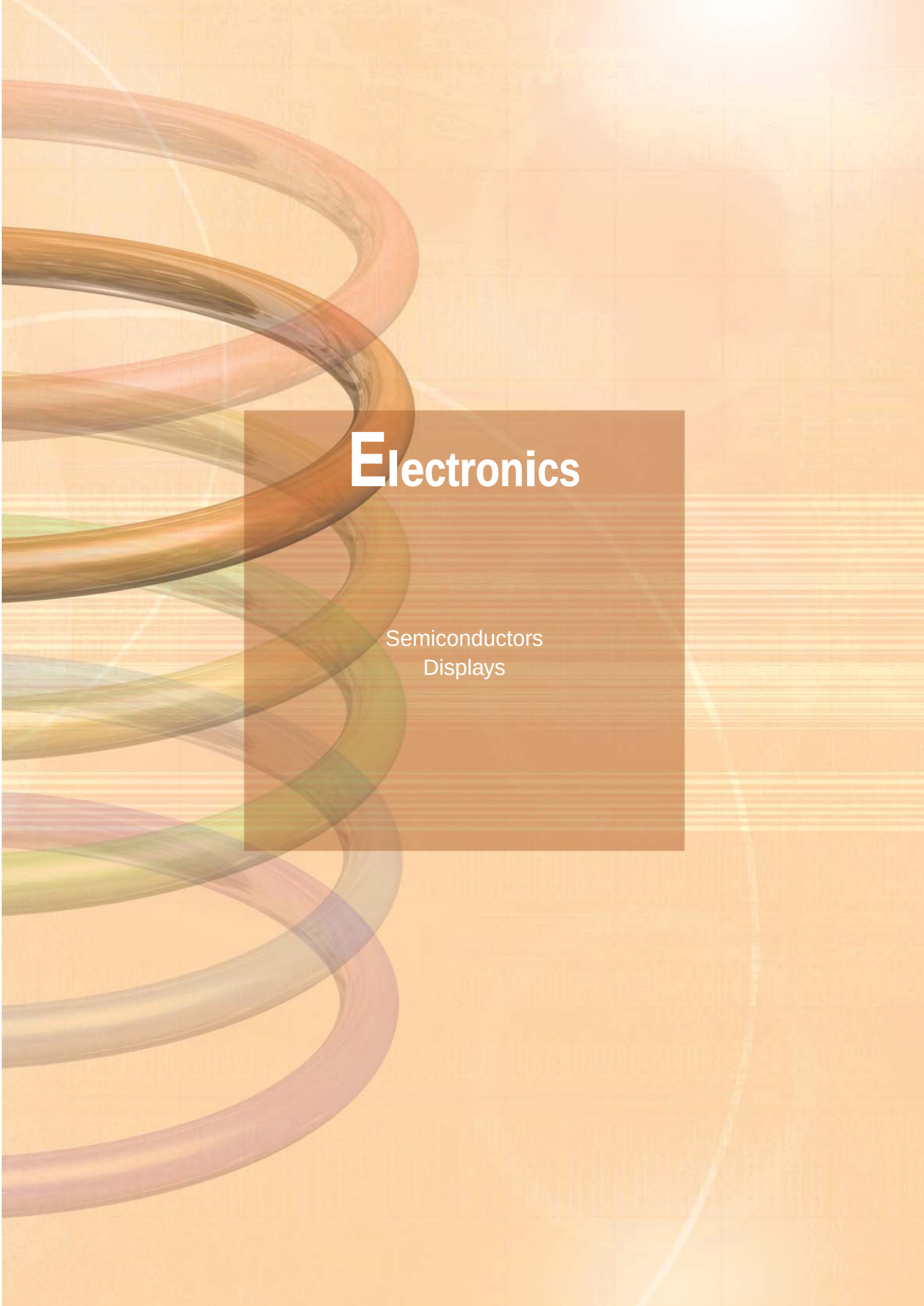

Electronics
Semiconductors
Displays

High-speed 144-Mbit Cache Memory “HDL5KM Series”

Hitachi has released the high-performance 144-Mbit cache*1 Memory “HDL5KM series” with world-leading 8-ns*2 random access time and 4-Gbyte/s*3 data bandwidth.

To enable high-performance operation of computers and network equipment, high-speed SRAMs have been used in their memory systems. For further improvement of such systems, large capacity memories such as DRAMs operating at the high-speed equivalent of that of SRAMs are much sought after.

The new series was developed by combining the high-speed CMOS logic process and the leading-edge DRAM process, achieving both large memory capacity of 144-Mbit and SRAM-level high-speed performance. Adopting the new series to the cache memory of high-performance servers, buffer memory*4, or table memory*5 of network equipment such as routers and switches further improves their performance.

[Major features of the “HDL5KM series”]

(1) Large capacity cache memory of 144 Mbit

The new series, packaged in a standard BGA package which is compatible with that of SRAMs, enables memory systems with capacity 4 to 8 times larger than SRAM-based systems, which means that the price per bit can be lower than one fourth of the SRAMs, leading to a significant cost reduction of the systems.

(2) High-speed operation of 8-ns random access time and 4-Gbyte/s data bandwidth. The random access time and random cycle time of the new series are both 8 ns and read operations or write operations can be performed at 4-Gbyte/s maximum bandwidth, such features being equivalent to those of SRAMs. Late write function*6 adopted in the new series avoids conflicts between read data and write data at the input/output buses, which leads to highly efficient bus utilization. These characteristics enable fast processing of large data and contribute to improvement of performance of computers and network equipment.

(3) Ready to satisfy users with a wide range of needs

In addition to the variation of the number of data bits simultaneously written or read, ×36 and ×18, the lineup of the number of banks (single or 16)*7 is provided. Users can select the optimal product with such features which satisfy their system needs, such as servers, network equipment, and image processing systems.

*1 Cache (memory) : A high-speed memory located between the microprocessor and main memory. It is used to improve server performance by storing frequently-used data and reducing access to the slow-speed main memory.

*2 ns (nanosecond) : One-billionth of a second

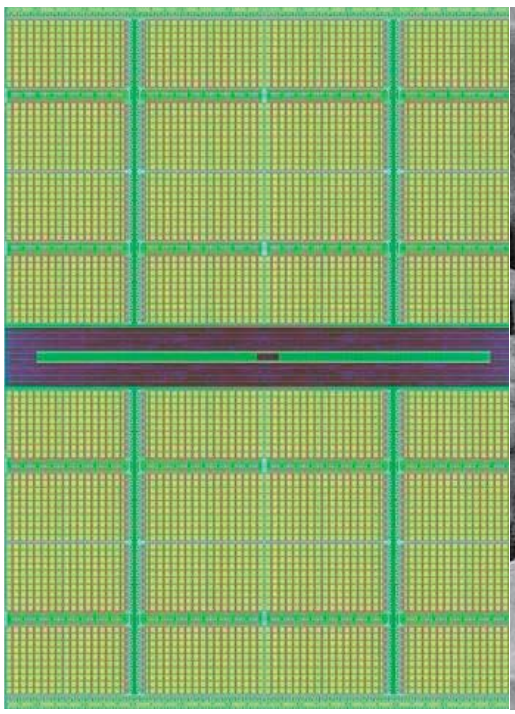
*3 Gbyte/s (gigabyte / second) : One billion bytes per second

*4 Buffer memory : A temporal storage of packet data used in network equipment

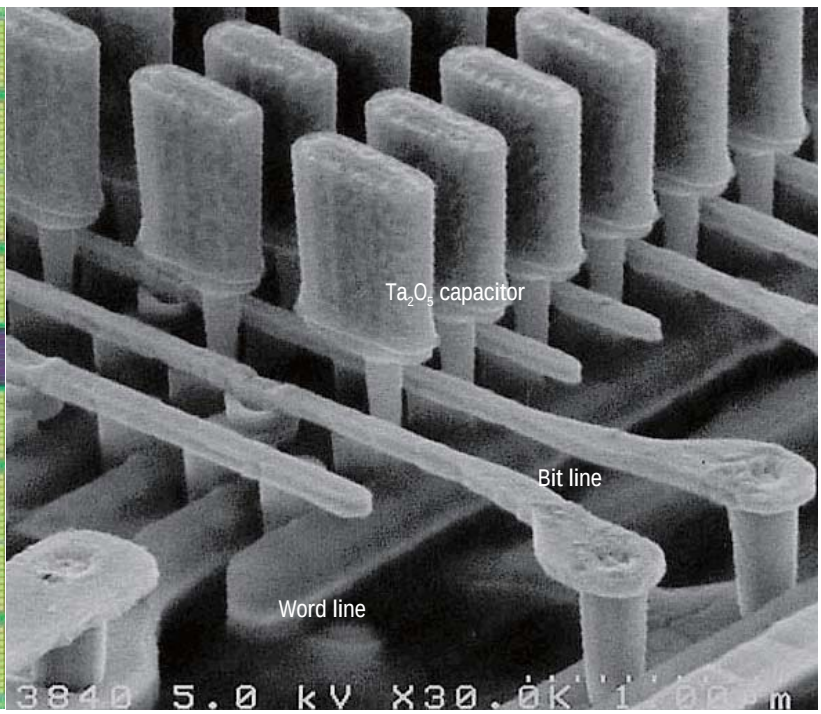
*5 Table memory : A storage of packet addresses for which destination addresses are searched in network systems

*6 Late write function : A function to set the timing of write data input to be the same as the timing of read data output

*7 Bank : A unit of memory blocks which can perform read operations or write operations independently from the other blocks



Microphotograph of the HDL5KM chip die



SEM (scanning electron microscopy) image of the HDL5KM memory cell

80-cm (32-inch) WXGA TFT-LCD Module for TVs

External view of 80-cm (32-inch) WXGA TFT-LCD module

To meet the demands of the flat TV market for larger size and higher performance, Hitachi has developed 80-cm (32-inch) WXGA* (wide-extended graphic array) TFT-LCD (thin film transistor liquid crystal display) module adopting AS-IPS (advanced super in-plane switching) technology.
The mounting of a wide viewing filter, in addition to AS-IPS, an LCD technology that excels in wide viewing angle, high brightness and color reproducibility, has widen the viewing angle in all directions and improved the picture quality furthermore.
Also, the combination of Super Impulse Driving Method and an overdrive circuit for improving the motion picture performance has realized the optimum picture quality for TV display.
[Main specifications]
(1) Display size: 80-cm (32-inch) diagonal
(2) Number of pixels: 1,280 (horizontal) × 768 (vertical)
(3) Display mode: AS-IPS
(4) Brightness: 500 cd/m^2
(5) Color reproducibility: 72% (ratio to NTSC standard)
(6) Driving method: Super impulse and overdrive circuit

* See “Trademarks” on page 90.

54-cm (21.2-inch) XGA TFT-LCD Module for Multimedia Applications

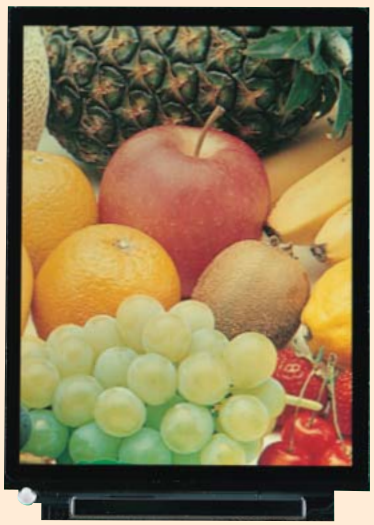
To meet the demands for multimedia applications, which can save space and power consumption, Hitachi has developed a 54-cm (21.2-inch) XGA* (extended graphics array) TFT-LCD (thin film transistor liquid crystal display) module.
Combination of AS-IPS (advanced super in-plane switching) LCD, which uses high-aperture-ratio technology, and high-luminance backlight has produced high luminance and a wide viewing angle suited for multimedia applications. In addition, Super Impulse Driving Method, which inserts a black screen within one frame, has improved moving picture quality.
[Main specifications]
(1) Number of pixels: 1,024 (horizontal) × 768 (vertical)
(2) Luminance: 450 cd/m^2
(3) Color reproducibility: 72%
(4) Viewing angle (contrast ratio > 10): over 170 degrees (vertically and horizontally)
(5) External dimensions: 487.3 (width) × 364.4 (height) × 37.0 (thickness) (mm)

* See “Trademarks” on page 90.

External view of 54-cm (21.2-inch) XGA TFT-LCD module

IPS Low-temperature Poly-silicon TFT-LCD for Mobile Phones

Mobile phones are used not only for telephone communication, but also as information terminals and digital cameras. Accordingly, demand for high-quality LCDs used in them is growing.
To meet these demands, Hitachi has developed a 5.6-cm (2.2-inch) diagonal QVGA (quarter video graphics array) — IPS (in-plane switching) low-temperature poly-silicon TFT-LCD based on the IPS display mode, which has high color reproducibility in all directions, for supporting mobile devices. This product has the following features: (1) low power consumption, (2) usable at a wide range of temperature and (3) reflect function to ensure outdoor visibility.
[Main specifications]
(1) Number of pixels displayed: 240 RGB (horizontal) × 320 (vertical)
(2) Pixel pitch: 0.141 × 0.141 (mm)
(3) Viewing angle: over 170 degrees (vertically and horizontally)
(4) Color reproducibility: 50% (ratio to NTSC standard)
(5) Interface: RGB 6-bit digital



External view of IPS low-temperature poly-silicon TFT-LCD for mobile phones

Low-temperature Poly-silicon TFT-LCD for Digital Still Cameras

Hitachi has released a 5.6-cm (2.2-inch) diagonal large-sized, low-temperature poly-silicon TFT-LCD, which is easily read in sunshine, and therefore suited for digital still cameras.
[Main features]
(1) A transflective low-temperature poly-silicon TFT-LCD panel, easily viewable even outdoors, enabled by combining the reflection mode using outside light for display and the transmission mode without degrading the performance of the transmission mode.
(2) A downsized external shape of the module was achieved by mounting Hitachi's proprietary slim digital-input type LCD driver IC with built-in controller function on the glass substrate instead of the external controller IC.
(3) Number of pixels displayed: 640 (horizontal) × 240 (vertical) dots
(4) Pixel arrangement: RGB delta
(5) Interface: RGB digital

External view of low-temperature poly-silicon TFT-LCD for digital still cameras