

Personal information equipment continues to change to meet requirements for diversification of information handled, higher performance and smaller size. Leading-edge technology is particularly crucial in developing products for multimedia-related equipment. Toshiba also develops environmentally conscious consumer products, with an emphasis on recycling and reducing the consumption of energy and resources.

Mobile Computing

GENIO PCV100 Pocket Communicator



GENIO PCV100 pocket communicator

Rapid spread of the use of e-mail and the Internet has spurred demand for portable devices. Introduced in July 1997, Toshiba's GENIO PCV100 pocket communicator uses the personal handy phone system (PHS) data transmission service that started in Japan in April 1997.

Adoption of the α DATA32 data transmission service of the DDI Pocket group allows GENIO to transmit data at up to 29.2kbps. High-density packaging technology was used for a small (215cm³) and lightweight (220g) device.

The main features of the device are telephone, electronic organizer, e-mail and Internet browser functions.

Libretto 100 MiniNote



Libretto 100 MiniNote

The Libretto series of mini-notebook personal computers incorporates miniaturization technology such as a high-accumulation, application-specific integrated circuit (ASIC) and an extra-thin 2.5-inch hard disk drive. At about one-third the size of a sheet of A4 paper, these pocket-sized PCs offer state-of-the-art technologies, such as a wide 7.1-inch TFT color LCD and a lithium ion battery. Windows[®] 95 is installed as the operating system. The portable office environment of the Libretto series opens up new possibilities in mobile computing.

Introduced in October 1997, the Libretto 100 MiniNote offers functions equivalent to a desktop model, with a 166MHz MMX[®] Pentium[®] processor and a hard disk drive with 2.0GByte capacity.

"Windows" is a registered trademark of the Microsoft Corporation.

"MMX" and "Pentium" are the registered trademarks of Intel Corporation.

MK2109MAF / MK4309MAT 2.5-Inch Ultra/Super Slim Hard Disk Drive for Notebook Computer

With 2.1GByte/4.36GByte capacity at a height of only 6.35mm/8.45mm, Toshiba's newly developed 2.5-inch hard disk drive expands notebook computer applications. 16/17 extended partial response (EPR) four-channel technology enables capacity of 2GByte on one disk platter.

The single-chip integrated circuit (IC), which incorporates DRAM, a servo controller and a disk controller, also contributes to further miniaturization of the printed circuit board.



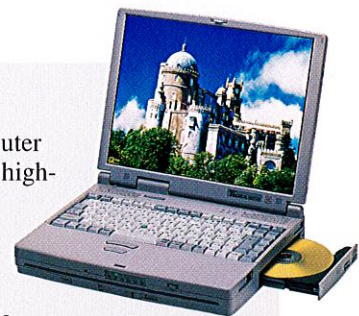
MK4309MAT 2.5-inch super-slim hard disk drive



Controller board

Tecra 780DVD High-Performance Multimedia Top-End Notebook Computer

The Tecra 780DVD is high-performance notebook computer with a DVD-ROM drive. A high-speed processor, a high-capacity hard disk drive and a Moving Picture Experts Group 2 (MPEG2) decoder system for DVD video enable high display and sound quality on playback. In addition to high-quality color LCD and CRT, the Tecra 780DVD is equipped with video and S-video outputs. Dolby[™] digital AC-3[™] audio provides high-quality, 5.1-channel sound with an external amplifier.



Tecra 780DVD high-performance multimedia top-end notebook

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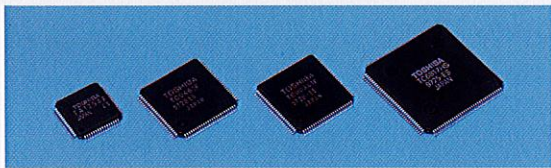
SD-C2002 Super-Slim DVD-ROM Drive and LSIs

The SD-C2002 second-generation DVD-ROM drive is the world's first super-slim drive for notebook PCs. It is also the first DVD-ROM drive to adopt partial constant angular velocity (P-CAV) technology, which supports constant rotational speed at the inner disk area and constant reading speed, also called constant linear velocity (CLV), at the outer area. As a result, the drive achieves both low power consumption and fast access.

To improve area efficiency and double access speed, Toshiba developed four new LSIs: the TA1254F analog signal processor; the TC90A41F digital data processor; the TC6461F servo controller; and the TC6817AF ATAPI interface controller with a built-in authentication circuit for copyright protection.



SD-C2002 DVD-ROM drive



LSIs

SD-C2002 super-slim DVD-ROM drive and new LSIs for DVD-ROM

PREMAGE 251 Digital Copier

In response to growing market demand for digital copiers, Toshiba has developed the PREMAGE 251 series of multi-function digital copiers that combine the functions of copier, facsimile and printer in a single machine. New CCD and high-speed image processing technologies enable a speed of 25 copies per minute and high resolution of 600dpi.

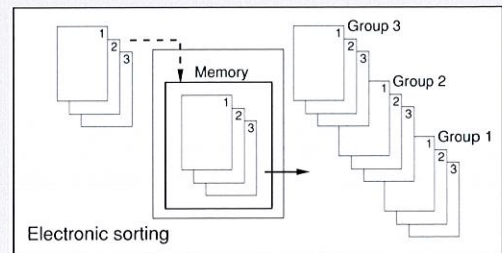


PREMAGE 251 digital copier

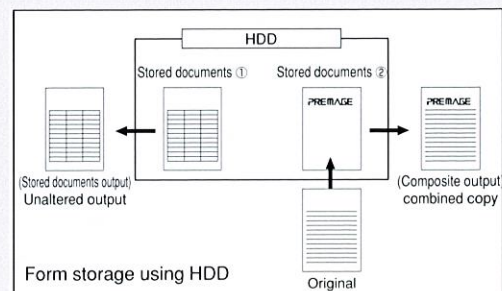
PREMAGE 251 also uses unique image processing methods such as bit mask error diffusion, which realizes a natural gray scale, and range correction, which optimizes density in real time. The copier combines these technologies to store high-quality images in its memory, and there is no image deterioration even in the electronic sort mode, in which multiple pages are printed from a single image scan.

By adding an optional hard disk drive (HDD), PREMAGE 251 offers unique digital features such as form storage, where previously stored documents can be printed out as needed.

A real-time operating system, a high-speed reduced instruction set computer (RISC) CPU, and improved multi-function parallel motion and operability help realize the above functions efficiently.



Electronic sorting



Form storage using HDD

DVD Video Players and Related Technology



SD-K310 DVD video player



In November 1996, Toshiba introduced the first DVD video players in the Japanese market. In June 1997, Toshiba introduced the SD-K310 multi-function DVD video player, followed by the SD-3107 for the overseas market in July, and the B5-sized, easy-to-carry SD-P410, the world's smallest DVD video player, for the Japanese market in November. Toshiba's strategic product lineup is accelerating the expansion of the market for DVD video players.

The main features common to SD-K310, SD-3107 and SD-P410 are as follows:

- Three-dimensional sound, the first ever for DVD players, delivers audio quality equivalent to a concert hall. Using only two speakers, the 3-D sound provides the same effects as a multi-channel surround system.
- A zoom function allows users to enlarge up to four times any selected part of the screen, such as small text or picture details.
- A newly developed video encoder IC enables superior playback quality with higher resolution and clearer picture.

In addition, the main features of the compact SD-P410 DVD video player include superior design and button layout emphasizing ease of operation and user convenience, as well as a disc memory function that stores the final playback status for each of the last ten discs played.



SD-P410 compact DVD video player

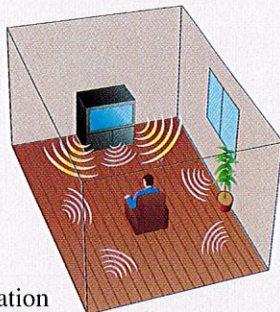


Image of 3-D sound

- Actual sound source
- Virtual sound source

TLP511U XGA LCD Data Projector

The TLP511U LCD data projector uses 1.3-inch XGA LCD panels and a newly developed compact optical unit. Its size is significantly smaller and definition is higher than Toshiba's previous SVGA model.

Its main features are as follows:

- A 120W UHP (Ultra High Power) lamp provides a high-intensity output of 600 ANSI (American National Standards Institute) lumens for high-quality images.
- VGA, SVGA and SXGA signals are convertible to an XGA screen image. The TLP511U can also handle all of the world's main video signal formats (NTSC, PAL and SECAM).
- A document imaging camera incorporates a CCD of 480,000 pixels. The camera enables sharp projection of PC and video images, hand-written and printed materials, and three-dimensional objects.

SXGA: Super eXtended Graphics Array (1,280 x 1,024 dot)

XGA : eXtended Graphics Array (1,024 x 768 dot)

SVGA: Super Video Graphics Array (800 x 600 dot)

VGA : Video Graphics Array (640 x 480 dot)



TLP511U XGA LCD data projector

TP71G90 71-Inch Projection Television

Toshiba has started sales of its TP71G90 71-inch projection television, which is equipped with a progressive scan system.

Its main features are as follows:

- The newly developed progressive scan system realizes a high-quality, high-definition image without line flicker, which is more noticeable on larger screens.
- A new 3D-Y/C separation circuit drastically reduces dot crawl and color interference.
- The new optical system, composed of a 71-inch, high-contrast dark tint screen, high-focus CRT and lens system, realizes sharp, brilliant images.
- The television is equipped with a color difference input for digital media devices.



TP71G90 projection television

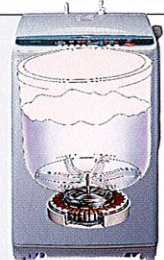
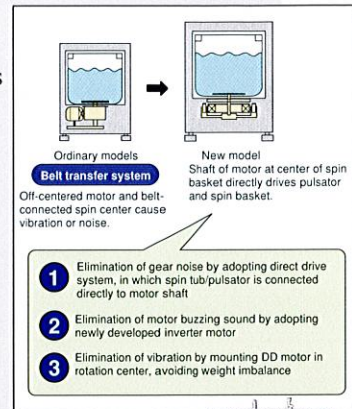
Automatic Washing Machines with Direct Drive Inverter Motor



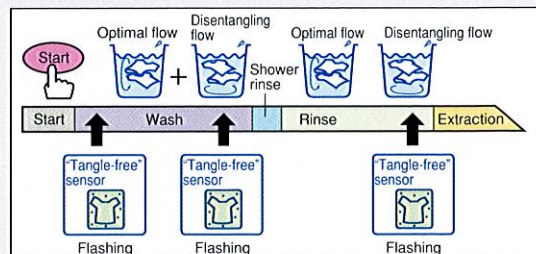
AW-B80VP automatic washing machine with direct drive inverter

Meeting demand for quieter washing machines has been difficult with conventional models that employ a belt and gears. In response, Toshiba has developed a direct drive (DD) inverter motor for use in its AW-B70VP/B80VP automatic washing machines that emit the lowest wash/spin noise of any washing machines in Japan. Combined with elimination of mechanical and brake noise from the mechanical assembly, the DD inverter motor reduces wash cycle noise by 6dB and spin cycle noise by 9dB on the regular setting and 14dB on the "Silent Night" setting.

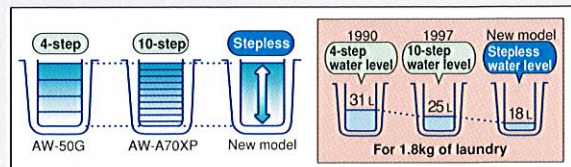
While the inverter regulates the rotation speed by laundry quantity and type, a "tangle-free" sensor checks the condition of the laundry during the wash cycle and adjusts rotation accordingly to reduce entanglement. In addition, newly developed software for linear water-level control senses the volume of laundry to determine the optimum water level with greater flexibility than the conventional ten-step water-level control.



Direct drive motor drive system



"Tangle-free" sensor



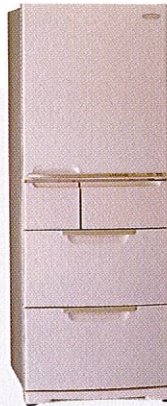
Conventional water-level steps vs. linear level control

GR-Y45KC Refrigerator with Triple Inverter Fan

To build a refrigerator adaptable to changing eating habits and lifestyles, Toshiba developed a temperature control damper for models of the popular 400-liter class that enables switching the temperature of a single compartment among six settings: freezer; partial freezer; chilled; refrigerator; vegetable crisper; and wine cooling. Next, the separate ice-making compartment was made significantly easier to use.

Separate fans for ice making and high-speed cooling of the freezer were added to the existing circulation fan and compressor cooling fan. Introducing DC brushless motors for these fans and using an inverter to control wind volume and velocity improved cooling capability. These improvements enable Toshiba's GR-Y45KC refrigerator with triple inverter fan to make ice in half the time and quick-freeze items in one-third the time required by last year's model.

Other improvements reduce environmental impact. An improved condenser for greater efficiency in the freezing cycle and inverter control for more efficient cooling decrease electric consumption 17% from the last year's model. Furthermore, a centralized condenser pipe offers greater ease of disassembly, in anticipation of new regulations relating to recycling of home appliances.



GR-Y45KC refrigerator with triple inverter fan



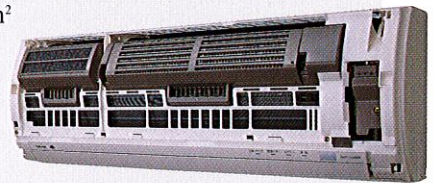
BDR Series Air-Cleaning Air Conditioners

Toshiba's BDR series of air conditioners incorporate an air-cleaning unit and hybrid inverter to offer improved air-cleaning performance, heating capability and energy consumption.

An electric particle collecting unit uses a corona discharge to charge polluting particles in the air, such as tobacco smoke and pollen, which are then adsorbed on electrodes by Coulomb attraction. With an ability to reduce air particle density in an approximately 16m² room by 10% within 30 minutes, the unit achieves the highest cleaning performance of any commercially available air conditioner.

The deodorizing filter can be reused with cleaning efficiency equivalent to its original state because titanium oxide (TiO₂) acts as a catalyst in dissolving adsorbed gases when exposed to ultraviolet rays.

The hybrid inverter operates the DC compressor through a combination of pulse width modulation (PWM) control by the inverter and pulse amplitude modulation (PAM) control by the converter. The resulting high efficiency and high power factor allow the air conditioners to offer a heating capacity of 5.1kW at an outdoor temperature of 2°C, which is greater than that of a kerosene fan heater. The annual running cost of ¥24,700 is the lowest in the industry.



Cut-away view of BDR series air-cleaning air conditioner