

**ADDITIONAL INFORMATION
PROVIDED BY THE ICC**

PART A

DVD Drives Used Exclusively in Conjunction with ADP Machines

Typical Specifications of a 16X DVD-ROM Drive

- Medium Format
 - DVD-ROM disc: Conforms to the DVD Book Version 1.0 Standards.
 - Supported formats: Single Layer, Dual layer, DVD-R (disc at once and multi border) and DVD-RW.
 - CD-ROM disc: Conforms to the Yellow Book (ISO/IEC10149), Red Book (IEC908 and system Description CD-ROM XA) CD standards.
 - Supported formats: CD-DA, CD-ROM Model, CD-ROM XA Mode2 Form 1, CD-ROM XA Mode2 Form 2, Photo CD (Single and Multiple session), CD-Extra, CD-R and CDR-RW (supports AM2)
- ❶ Disc size:
 - 120 mm (5-inch)
 - 80 mm (3.5-inch)
- ❶ Data Transfer Rate

Sustained:

DVD (6.6-16X CAV mode):

 - Minimum: 8910 KB/second
 - Maximum: 21600 KB/seconds

CD-Rom (17.2-40S CAV mode, 16 Kbytes or greater block transfers):

 - Minimum: 2586 KB/second
 - Maximum: 6000 KB/second

Burst Max:

 - 16.6 Mbytes / second (PIO Mode 4)
 - 33.3 Mbytes / second (Ultra DMA 66)
- ❶ Buffer Memory Size
 - 256 Kbytes
- ❶ Access Time / Seek Time

Access Time (Average):

 - DVD-ROM: 95 milliseconds (random average)
 - CD-ROM: 80 milliseconds (random average)

Random Seek Time (Average):

 - DVD-ROM: 85 milliseconds (random average)
 - CD-ROM: 70 milliseconds (random average)

Full Stroke Seek Time (Average):

 - DVD-ROM: 240 milliseconds (random average)
 - CD-ROM: 160 milliseconds (random average)
- ❶ Initialize / Start / Stop Time
 - Disk Initializing Time is the length of time between disc spin-up and the drive reaching a pause on the first address after reading the TOC.

DVD-ROM Type: 5 seconds

CD-ROM Type: 8 seconds

- Startup Time (Spin Up) is the length of time between the spindle stop condition of the drive unit and unit pausing on the address of track number one (after initialization, in response to the host computer sending a start command to the drive).

DVD-ROM Type: 3 seconds (random average)

CD-ROM Type: 3 seconds (random average)

- Stop Time (Spin Down) is the length of time between a pause condition and the disc rotation stopped by the STOP command.

DVD-ROM Type: 5 seconds

CD-ROM Type: 5 seconds

❶ Loading / Unloading Time

Loading is the length of time between the push of disc into the slot and the clamping of the disc inside the drive.

Max: 3 seconds (includes disc camped indie drive)

Unloading is the length of time (after the eject button is pressed) from the drive pause from the slot eject.

Max: 4 seconds

❶ Audio Characteristics

Output Level:

Line out: 0.70 ± 0.1 Vrms (10k ohms load)

Headphone out: 0.60 ± 0.5 Vrms (32k ohms load)

S/N Ratio: Line out: greater than 7 dB (JIS A-weighted; 2kHz LPF ON)

Frequency Response: Line Out: 17 Hz ~ 20 kHz ± 2.5 dB

Channel Separation: Line Out: >65 dB

THD: Line out: 0.1maximum (1kHz 0 dB: 20 kHz LPF ON)

❶ Acoustic Noise

Without loading Operation: Maximum: 43dB(A)

Example of a 16X DVD-ROM Single Drive – Tray Load (where DVD is loaded on a pull-out tray triggered by the lower right button).



Example of a 16X DVD-ROM Single Drive – Slot Load (where DVD is loaded on a pull-out tray triggered by the lower right button).



Example of a DVD Drive that writes and reads DVD-RW, DVD-R, CD-R and CD-RW media, and also reads CD-ROM and DVD-ROM discs. The drive offers up to 4.7GB of storage capacity on a single sided DVD disc.



DVD Drive Library Storage

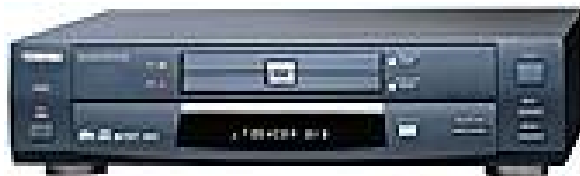
Current storage products on the global market include DVD libraries, which boast large storage capacity. The libraries offer the flexibility to accommodate any drive-to-disc ratio from a maximum of 720 discs with two drives to a maximum of 370 discs with 16 drives. Available drive options in some models include DVD/CD-ROM, CD-R and DVD-R. These storage libraries are typically used in the business environment where high capacity storage is necessary. Below is a visual depiction of a product in this category.



PART B

Standalone DVD Players

Typical Specifications of a Standalone DVD Player



FEATURES

- High-Mass Vibration-Resistant Cabinet
- DVD-Video/DVD-Audio/ VCD/CD/CD-R Playback
- DVD/CD Text Compatible

- Virtual Remote Control
- Quick Menu
- Angle Viewer
- Preview
- Strobe
- Picture Capture
- High-Mass Copper-Shielded Chassis
- First Setup Menu
- 4-Power Picture Zoom
- Parallel A/V Outputs
- X2 Playback
- x2, x8, x30 Forward and Reverse Scan
- 1/8, 1/4, 1/2 Slow Motion: Forward and Reverse
- DVD-Video/CD Playback
- Parental Lock
- Time Search
- Icon-Based On-Screen Displays
- Bit-Rate Meter
- Camera Angle Select
- Multi-Language Select
- Multi-Subtitle Select
- Title Stop
- Picture Set-up: Widescreen, Letterbox and Normal

VIDEO

- ColorStream® Component Video Output
- 10-bit 54MHz Video D/A Conversion with Super 4:4:4 Processing
- 3-D Digital Noise Reduction
- PLUGE
- Aspect Ratio Compensation
- 540 Lines Horizontal Resolution
- 10-bit Video DAC (Digital to Analog Converter)
- Video Black Level Expansion
- S-Video Output
- Composite Video Output
- Parallel Video Output

AUDIO

- Performance-Matched Audiophile-Grade Componentry
- DVD-Audio Decoding and Playback via 6 Channel Analog Outputs
- HDCD® Precision Filtering and Decoding
- 24-bit 192kHz PCM Audio Compatible
- CD-R Compatible
- Advanced Multiport Parallel Audio DAC System

- Multibit Delta Sigma Audio DACs
 - Polypropylene Film Capacitors
 - Direct Audio/Video On Mode
 - Built-In Dolby® Digital Decoding with 5.1 Channel Analog Outputs
 - Toslink Digital Audio Output
 - One Pair of Analog Audio Outputs
 - 24-bit PCM Audio Compatible (minimum 96kHz)
 - Dolby® Digital & DTS® Compatible
 - Coaxial Digital Audio Output
 - Dynamic Range Control
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Portable DVD Video Players

Portable DVD players are similar to standalone DVD players, except that they are portable, have a screen, and are generally much lighter in weight. The portability nature of the player allows the user to travel with the device.



Such portable players typically have the following features:

- Thin and lightweight design for a mobile system.
 - LCD screen
 - Surround Sound Audio System
 - Dialogue Enhancer which increases the center channel volume (relative to other channels), making movie dialogue easier to hear and understand.
 - Video Digital-to-Analog Converter. The Digital-to-Analog converter helps provide high picture quality. By processing the DVD video signal at two times the original rate, this feature provides vivid and finely textured image reproduction.
 - Optical Digital Output for standard audio systems.
 - Built-in Recharger Function. This feature allows the user to connect the battery pack to the player, plug in the AC adaptor, and start recharging.
 - “Cinema Mode” feature which combines brightness control with picture noise canceling to provide better picture quality in certain viewing conditions.
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Portable DVD Audio/Video Players



Such portable players typically have the following features:

- Thin and lightweight design for a mobile system.
- LCD screen
- Surround Sound Audio System
- Dialogue Enhancer which increases the center channel volume (relative to other channels), making movie dialogue easier to hear and understand.
- Video Digital-to-Analog Converter. The Digital-to-Analog converter helps provide high picture quality. By processing the DVD video signal at two times the original rate, this feature provides vivid and finely textured image reproduction.
- Audio Digital-to-Analog Converter.
- Built-in Recharger Function. This feature allows the user to connect the battery pack to the player, plug in the AC adaptor, and start recharging.
- “Cinema Mode” feature which combines brightness control with picture noise canceling to provide better picture quality in certain viewing conditions.
- Some are equipped with “playback” capability for DVD-R/RW and CD-R/RW recordings.

DVD Video Recorder/Players



The above unit is a standalone desktop unit that can read and record DVD-Video discs. Recordings are made using either write-once DVD-R or recordable DVD-RW discs. The unit can also play DVD-Video discs on read-only, DVD-R, and DVD-RW media, as well as CD Audio and VideoCD discs on read-only, CD-R and CD-RW media. Main Features of these units include:

- Records DVD-Video and Video Recording (VR) discs on DVD-R (General type) and DVD-RW media
 - Records in DVD-Video and Video Recording (VR) modes
 - One or Two hour capacity (DVD-Video mode)
 - One to Six hour capacity, adjustable in 32 steps (VR mode)
 - Plays DVD-Video discs on DVD-R, DVD-RW and read-only media
 - Plays CD Audio and VideoCD discs on CD-R, CD-RW and read-only media
 - Records analog video (composite and Y/C) and digital camcorder (IEEE 1394) signals
 - Records two-channel Dolby Digital audio
 - Generates and records onscreen DVD-Video title menu with user definable text buttons for up to 99 recorded titles (DVD-Video mode)
 - Generates virtual onscreen video navigation menu for quick visual title recognition and access on DVD-RW media (VR mode)
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DVD Players for Mobile Entertainment for Vehicles



A newer product on the global market is the DVD player for mobile entertainment. It appears that manufacturers are producing more entry-level DVD systems for the car along with 16 x 9 aspect-ratio monitors for the more sophisticated market. The transition to DVD is expected to move quickly given DVD's fast penetration into the home market where there's already an installed base of more than 10 million players. According to a report by Forrester Research, 27 percent of consumers expressed interest in a DVD player for passenger viewing. (Source: <http://www.ce.org/digitalamerica/mobile/mobile6.asp>)

These players are typically for rear-seat passengers to watch a DVD movie. Manufacturers are producing two types of products: (1) a single-disc DVD player that integrates an LCD screen and fits into the back of the seat; and (2) a single-disc DVD player that is in-dash mounted for easy access. Both products play DVD movies and audio CDs. These products are for the consumer to "have a movie theater on wheels."

DVD Players for Navigational Purposes



Mobile navigation systems utilizing DVD media are being produced to serve as both a navigation tool and a mobile entertainment system. These systems typically integrate a DVD player; a Global Positioning Satellite (GPS) antenna; a full-function remote controller; and a dual-layer DVD-ROM (media) containing a database of the maps and related information. The above-pictured model has a widescreen display; others have a smaller display. The system includes a built-in high-performance processor for fast access to the database. These systems can also typically play DVD movies and audio CDs.

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