Manual
Toshiba SD-M1612
DVD-ROM Drive
16x/48x ATAPI IDE DRIVE

Front Panel
This DVD-ROM drive should be used only in its current hardware and software configuration.

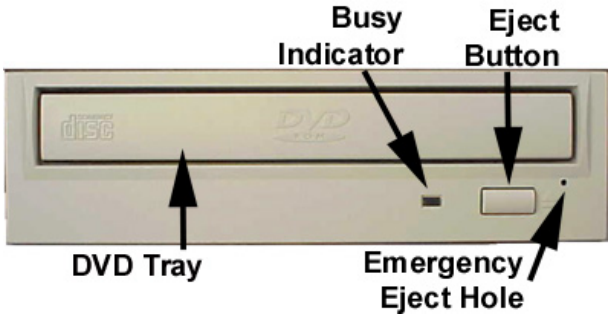


Figure 1 - SD-M1612 DVD-ROM Front Panel

Eject Button The EJECT button is used to open the disc tray so you can install or remove a disc.

Busy Indicator When you install a disc into the DVD-ROM drive, the BUSY light flashes slowly as it attempts to locate the disc. One of the following will occur:

BUSY light goes out. The DVD-ROM drive is ready to read data from the disc.
BUSY light flashes slowly. The disc may be dirty.
BUSY light remains ON. The DVD-ROM is accessing data.
BUSY light remains ON indefinitely. The DVD-ROM is experiencing an error

Emergency Eject Hole The emergency eject hole is to be used only when the DVD tray will not open when EJECT button is pressed.

DVD Tray Insert DVD Disc in tray.

Toshiba SD-M1612 DVD-ROM Setup

The following steps must be performed to properly install your DVD-ROM:

Set DVD-ROM Drive Jumper Settings
Attach IDE BUS Cable
Attach Power Cable
Connect Audio Cable *(optional)*
Mount DVD-ROM

Jumper Settings
The mode select jumpers are 6 straight angle pins located on the rear of the DVD-ROM. By placing a jumper on the pins, you can select the following functions:

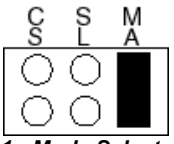
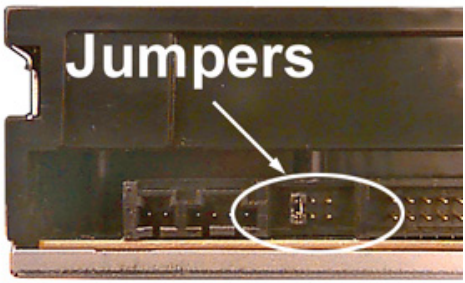


Figure 1 - Mode Select Jumper

CS	Drive is configured using host interface signal CSEL
SL	Configures drive as Slave
MA	Configures drive as Master (default mode)

In most installations, jumper should remain in the MA position (factory default). It is recommended that you install your DVD-ROM only on the secondary IDE BUS. If you are installing on primary IDE BUS, your hard drive would then be the Master, and you should set your DVD-ROM to the Slave position (SL)

Figure 2 - Jumper Locations



Placing the DVD-ROM inside your Computer

Now that you have set the jumpers, you are ready to install your DVD-ROM inside your computer.

Important Note: Disconnect power from your computer system before beginning installation.

Remove computer cover and faceplate if required. Refer to your computer system's manual for removal information. If DVD-ROM is replacing a CD-ROM, remove CD-ROM presently installed in your system.

Your Toshiba DVD-ROM can be placed in any free half-height drive slot at the front of your computer. (It can be mounted horizontally or vertically.)

Carefully start sliding the DVD-ROM into the opening with the disc tray facing the front of the computer. Before you push the drive all the way in you will need to connect the IDE BUS cable, Audio cable and the Power cable on the back of the drive.

Connecting Cables

IDE BUS Cable *(not supplied with drive)* - Your computer system should have a primary and secondary IDE BUS, cable with your hard drive most likely being the Master on the primary BUS. Connect BUS cable as follows, assuring that pin 1 of cable (side with red stripe) is connected to pin 1 of DVD-ROM interface connector:

If you are replacing your CD-ROM:
connect DVD-ROM to the BUS Cable connector that the CD-ROM was connected to.

If DVD-ROM is not replacing a CD-ROM or is an addition to a CD-ROM:
connect DVD-ROM to an open connector on the secondary IDE BUS cable (not supplied with drive).

If DVD-ROM is to be slave on Primary BUS:
connect DVD-ROM to open connector on the primary IDE BUS cable (not supplied with drive).

Figure 3 - Installing BUS Cable

Power Cable - Connect an internal computer power supply cable to the power socket at the back of the DVD-ROM. One side of the plug has chamfered edges, so the power connector fits only one way. Push plug completely into the socket making sure the plug fits correctly.

Figure 5 - Installing Power Cable

Audio Cable (optional) - If you have a sound card and speakers, and would like to play audio CDs on your computer, you will need to install a CD/DVD audio cable. Toshiba's CD-ROM/DVDs use a standard 4-pin audio cable that can be purchased from most local computer suppliers. The sound cable connects to your sound card at one end and the other end connects to the digital audio connector at the left rear of the DVD (see DVD Back Panel photo for location). Refer to the instructions that came with your sound card for details on any sound-driver software required

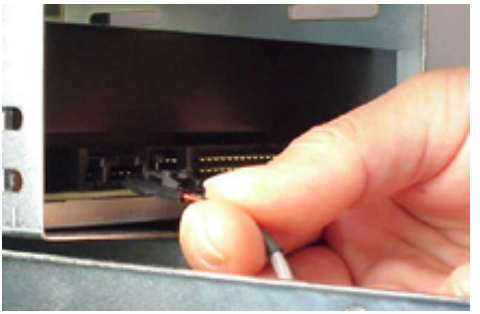


Figure 4 - Installing Audio Cable

Completing Installation

After you have connected all the necessary cables, push the DVD-ROM completely into the computer´s drive slot. Mount drive per your computer´s instructions. The screw length should not exceed 3±0.5mm (measured from outside surface of side or bottom of DVD-ROM to tip of screw). Replace computer cover and all outer screws.

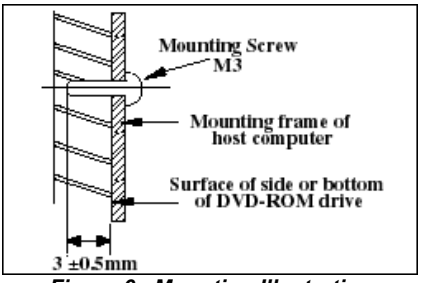


Figure 6 - Mounting Illustration

Software Driver - Toshiba's DVD-ROM drive is "plug n' play". In Windows, when you apply power to your computer and boot-up, the system will recognize new hardware, and begin installing Window's ATAPI driver

Toshiba SD-M1612 DVD-ROM User's Guide

Using the DVD-ROM Drive

Drive Operation

Inserting a DVD or CD - Horizontally

To insert a DVD or CD in a DVD-ROM drive that is mounted horizontally, perform the following steps:

Figure 1 - Inserting DVD or CD

Open the DVD Loading tray by pressing the Eject Button.
Place DVD or CD disc into DVD Loading tray
Press Eject button again or gently push on the open disc tray. Tray will automatically close.

Inserting a DVD or CD - Vertically

To insert a DVD or CD disc in a DVD-ROM drive that is mounted vertically, perform the following steps:

1. Locate disc holders (4 locations) on DVD Tray.
2. Position the disc behind disc holders.
3. Close the drive by gently pushing in the tray or pressing the eject button.

Figure 2 - Inserting DVD or CD Vertically

Removing a DVD or CD

To remove a DVD or CD disc from the DVD-ROM drive, perform the following steps:

Open the DVD Loading tray by pressing the Eject Button.
Grasp DVD or CD disc by edges, and lift out of loading tray.
Press Eject Button again to close DVD Loading Tray.

Usage Guidelines

1. Keep the disc tray closed when not using the DVD-ROM drive.
2. Do not press down on the disc tray when opening or closing it.
3. Do not place objects on the disc tray.
4. Never use a damaged, broken, or deformed disc.
5. Do not press the Open/Close button while the drive is playing a DVD movie. To stop a DVD movie, click Stop button in the DVD player application program.

NOTE: High-speed drives spin the disc at a high rotational speed. If a DVD has printing on only half of the disc, or if there is a slight imbalance in the DVD, the imbalance is greatly magnified by the high speed, causing the drive to vibrate or produce a fan-like noise. These effects are inherent in the high-speed technology and do not indicate a problem with the drive.

Emergency Ejection

CAUTION: The following procedure is intended only as a last resort when pressing the eject button fails to open the DVD tray.

1. Turn computer power OFF by properly shutting down system.
2. Insert a solid bar (i.e. large paper clip) into Emergency Eject hole and push in as shown in the picture below.
3. DVD tray will open/eject.

Figure 3. Using Emergency Eject

This procedure cannot be repeated without cycling the DVD-ROM's (computer's) power. After the media is removed and the loading tray is closed, the tray will not reopen without first turning the power ON/OFF.

NOTE: Use a bar that is less than 1.5 mm in diameter.
Do not insert more than 50mm in depth.
Inserting more than 50mm may damage the DVD-ROM drive.

Handling Media

DVD media is sensitive to dust and fingerprints. Carefully handle media by its edges only. If a DVD movie skips or hangs during playback, clean the media. Most DVD video playback issues are media-related and can be remedied by proper handling and care of media.

Cleaning Media

Try to avoid touching the read area (underside) of the disc as dirt and smears will degrade the disc accessing speed.

If the disc becomes dirty wipe it with a damp soft cloth. Avoid cleaning in a circular motion, but rather from the inner side outward.

General

Interface	ATAPI
Compatible DVD-ROM Standards	
DVD	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18) DVD-R, DVD-RW, DVD-RAM
CD	CD-DA CD-ROM CD-I Bridge (Photo-CD, Video CD) Multi-session (Photo-CD, CD Extra, CD-RW, CD-R) CD-MINI CD-TEXT CD+(E)G CD-ROM-XA CD-I CD-R (Read) CD-RW (Read)
Storage Capacities	
DVD	4.377GB (DVD-5) 7.959GB (DVD-9) 8.754GB (DVD-10) 15.917GB (DVD-18) 3.679GB (DVD-R, Ver. 1.0) 4.377GB (DVD-R, Ver. 2.0) 2.324GB (DVD-RAM, Ver 1.0) 4.377GB (DVD-RAM, Ver 2.1)
CD	656.5MB (mode 1) 748.8MB (mode 2)

Performance

Rotational Speed

DVD-ROM	
(6.0X - 16X) single layer	9,200rpm
(4.1X - 10X) dual layer	6,300rpm
DVD-R (Ver 2.0), DVD-RW	
(2 - 4.8X)	2,780rpm
DVD-R (Ver 1.0) (2 - 4.8X)	3,200rpm
DVD-RAM (Ver 1.0) (2X)	2,160 - 4,800rpm
DVD-RAM (Ver 2.1) (1X)	1,380 - 3,300rpm
DVD-Video CSS-disc (2 - 4.8X)	2,780rpm
CD-ROM, CD-R, CD-RW (20.7X - 48X)	9,500rpm
CD-DA Transfer (14 - 32X)	1,800 - 4,300rpm
CD-DA/Video CD (4X - 7.8X)	1,200 - 2,000rpm

Data Transfer Rate

Sustained Rate	
DVD	8,910 - 21,600 KBytes/s
DVD Dual Layer	5,540 - 13,500 KBytes/s
DVD-Video	2,704 - 6,536 KBytes/s
DVD-R, DVD-RW	2,704 - 6,536 KBytes/s
DVD-RAM (Ver 1.0)	2,704 KBytes/s
DVD-RAM (Ver 2.1)	2,704 KBytes/s
CD (mode 1)	3,105 - 7,200 KBytes/s
CD (mode 2)	3,541 - 8,212 KBytes/s

Burst Rate

16.7 Mbyte/s (PIO Mode 4)
16.7 MByte/s (multiple word DMA transfer mode -2)
33.3 MByte/s (Ultra DMA)

Access Time (Random)

DVD-ROM	95ms
DVD-RAM	170ms
CD	85ms

Data Error Rate

DVD	10^{-15} Max
CD	10^{-15} Max (Mode 1) 10^{-12} Max (Mode 2)

Spin-up Time

DVD	1.5s Typ
DVD-RAM (Ver 2.1)	1.5s Typ
DVD-RAM (Ver 1.0)	1.9s Typ
CD	1.4s Typ

Memory Buffer

512Kbytes

Reliability

MTBF	100,000 hours
Power ON Hours	5,436 hours/year
ON/OFF Cycles	313 cycles/year
Number of Access	600,000 accesses/year
Operating Duty Cycle	20% of Power ON time (Reading/Seeking)
MTTR	0.5 hours

Audio

Number of Channels	2
Frequency Response	20Hz to 20,000 Hz
Distortion	-80 dB (at 1kHz JIS A-weighted)
Output Levels	
Headphone	0.90V (rms Typ)
Analog Line Out	0.79 V (rms Typ)
Digital Line Out	0.50 V (p-p)

Environmental

Ambient Temperature

Operating	5° to 50° C (41° to 122° F)
Storage	-10° to 60° C (14° to 140° F)
Shipping	-40° to 65° C (-40° to 149° F)

Temperature Gradient

Operating	11° C /hour (max)
Storage/Shipping	20° C /hour (max)

Relative Humidity

Operating	8% to 80%
Storage/Shipping	5% to 95% (wet bulb 27° C max)

Vibration

Operating	no hard error: 10 to 500 Hz 2.45 m/s^2 [0.25G] (O-P) (excludes resonance point)
Non-operating	no damage: 5 - 10Hz 5mm (P-P) 10 - 500Hz 9.8m/s^2 [1G] (O-P)

Shock (Non-operating) 490 m/s^2 [50G] (Half sine wave 11ms)

Acoustical Noise 42dB (IEC 179 A-weighted at 1m)

Power

DC Voltage and Current Requirements: 5V ±5%, 12V ±5%

	+5V	+12V
Sleep	280mA	0mA
Standby	300mA	0mA
Idle	580mA (DVD) 600mA (CD)	50mA (DVD) 50mA (CD)
Random Access (average)	930mA (DVD) 850mA (CD)	710mA (DVD) 870mA (CD)

Physical

Height 5.75" (146mm)

Width 1.6" (41.5mm)

Depth 7.6" (193mm)

Weight 2.18 lbs (0.99kg)

Connectors

DC input	AMP 1-480424-0
IDE Interface Connector	40 Pin ATAPI Standard
Analog Audio Line Output Connector	4 Pin ATAPI Standard (70066 Series, C Version)
Digital Audio Line Output Connector	2 Pin ATAPI Standard (70066 Series, C Version)

Lasers

CD Laser

Type	Semiconductor Laser and 3-beam System
Wave Length	770 - 795 nm

DVD Laser

Type	Semiconductor Laser and 1-beam System
Wave Length	770 - 650 nm

Regulatory

The SD-M1612 DVD-ROM has been certified by the following regulatory agencies:

UL
CSA
TUV
CE
CB
DHHS
BSMI

Toshiba SD-M1612 DVD-ROM

Drive Connectors

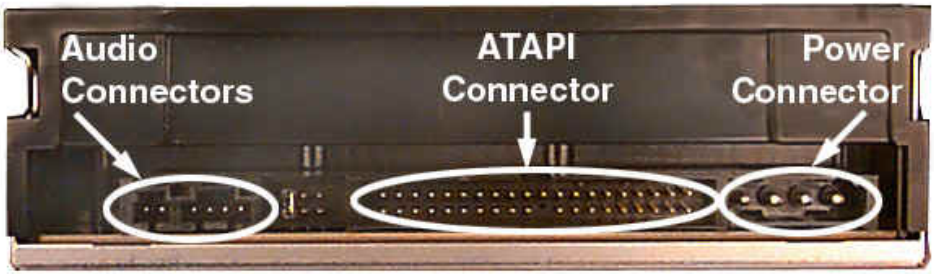


Figure 1 - SD-M1612 DVD-ROM Rear Panel - Connectors

Power Connector Power is supplied to your DVD-ROM by the connection with your computer's +12V/+5V power cable to the power socket at the back of drive. One side of the plug has chamfered edges, so the power connector fits only one way.

CAUTION: Severe damage to the DVD-ROM circuits may occur if power cable is plugged in upside-down with power ON.

Audio Connectors Supplies Analog and Digital sound to your system.

ATAPI Connector The SD-M1612 DVD-ROM is connected to your computer system through the ATAPI connector.

Table 1. Interface Pin Assignments

INTERFACE PIN ASSIGNMENT							
PIN NO.	**I/O**	**SIGNAL NAME**	**HOST SIGNAL NAME**	**PIN NO.**	**I/O**	**SIGNAL NAME**	**HOST SIGNAL NAME**
1	I	Reset	Host Reset	21	O	HDRQ	DMA Request
2	-	GND		22	-	GND	
3	I/O	HD7	Host Data Bus BIT 7	23	I	HWR-,STOP	Host I/O Write
4	I/O	HD8	Host Data Bus BIT 8	24	-	GND	
5	I/O	HD6	Host Data Bus BIT 6	25	I	HRD-, HDMARDY-HSTROBE	Host I/O Read
6	I/O	HD9	Host Data Bus BIT 9	26	-	GND	
7	I/O	HD5	Host Data Bus BIT 5	27	O	IORDY, DDMARDY-DSTROBE	I/O Channel Ready
8	I/O	HD10	Host Data Bus Bit 10	28	-	CSEL	Cable Select
9	I/O	HD4	Host Data Bus BIT 4	29	I	HDAK-	DMA Acknowledge
10	I/O	HD11	Host Data Bus BIT 11	30	-	GND	
11	I/O	HD3	Host Data Bus BIT 3	31	O	INTRQ	Host Interrupt Request
12	I/O	HD12	Host Data Bus BIT 12	32	O	IOCS16-	Host 16 BIT I/O
13	I/O	HD2	Host Data Bus BIT 2	33	I	HA1	Host Address Bus BIT 1
14	I/O	HD13	Host Data Bus BIT 13	34	I/O	PDIAG-	Passed Diagnostics
15	I/O	HD1	Host Data Bus BIT 1	35	I	HA0	Host Address Bus BIT 0
16	I/O	HD14	Host Data Bus BIT 14	36	I	HA2	Host Address Bus BIT 2
17	I/O	HD0	Host Data Bus BIT 0	37	I	HCS1-	Host CHIP Select 0
18	I/O	HD15	Host Data Bus BIT 15	38	I	HCS3-	Host CHIP Select 1
19	-	GND		39	I/O	DASP-	Drive Active/Drive 1 Present
20	-	(KEYPIN)		40	-	GND	