TOSHIBA
STORAGE DEVICE DIVISION

SD-M1401
DVD-ROM DRIVE
PRODUCT SPECIFICATION

May 2000

REV. 1.0

Specifications are subject to change without notice

Notice

1.This product has no over-current protection circuit.
  System should have appropriate over-current protection.
  Toshiba Corporation makes no warranty of damages caused by no over-current protection.

2.This has a little possibility of errors.
  To prevent damages and injury caused by the above, careful consideration for the safety and integrity
  should be taken in the system design.
  Do not use this product in a system that may cause hazard to human being or material loss caused by
  the failure, loss of data and/or errors of this product.

3.Do not disassemble or modify this product.
  Or, reliability, safety and performance can not be guaranteed.

4.Turn off the system power before mounting/removing this product.
  Or, it may cause failure or damage.

5.Because the DC power socket of this product allows insertion of only one side direction, ascertain
  direction carefully to insert the plug.

6.To build this product in an equipment, handle it only in electrostatically safe environment.
  Do not touch connecting terminals directly.
  Or, the product may be damaged by electrostatic energy.

7. This product can playback discs based on the formats described in item 3.1.(1). Do not load a disc
  which is not conformed with those formats such as a shaped disc or a disc with its weight unbalanced
  excessively.
  A very high speed rotation is carried out inside the product, so abnormal vibration and malfunction may
  occur if disc described above is loaded.

8. When a disc cannot be ejected because of some troubles, etc., turn off the power for the unit and eject
  the disc using the emergency eject mechanism after passing more than 1 minute.
  When the emergency eject is carried out while the power is on or immediately after the power off, the disc
  may be eject in a rotating status. We do not assure if the disc is damaged by this.

9. When you close the tray, power must not be turned off. If the tray is pushed in with the hand during
  power off, a breakdown may occur because the mechanism in the product is not in the transit
  state during power off.

10. This product comes under the regulations of TWA (The Wassenaar Arrangement on Export Controls
   for Conventional Arms and Dual Use Goods and Technologies).
   When exporting the product, an export permission according to the regulations of your country will
   be required.

11. As for mounting bracket to incorporate this product into an equipment,
    (1) When this product is incorporated into an equipment by using the mounting screw holes in the right and left side planes, the clearance between this product and the mounting bracket is too wide;
    (2) When this product is incorporated into an equipment by using the mounting screw hole in the bottom, the surface of the mounting bracket is contorted.

    If you use such mounting bracket as the above, this product will become deformed, which may cause operation failure. Therefore, it is necessary to take account of the mounting bracket which has the tolerances shown in Fig.1 or whose structure cannot cause this product to deform, as shown in Fig.2
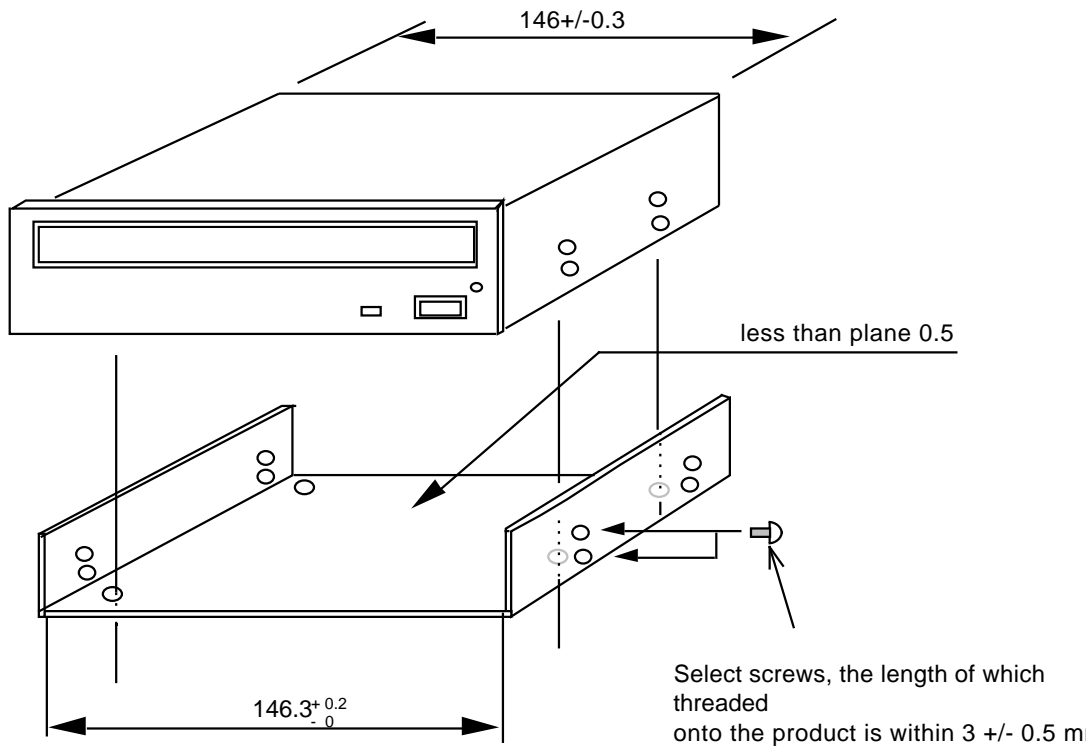
146+/-0.3

less than plane 0.5

Select screws, the length of which threaded
onto the product is within 3 +/- 0.5 m

$146.3^{+0.2}_{-0}$

Fig.1

When a large amount space is left, insert spacers, etc. to adjust the space less than 0.5 mm between the product and mounting bracket.

this product

this product

before the fixing

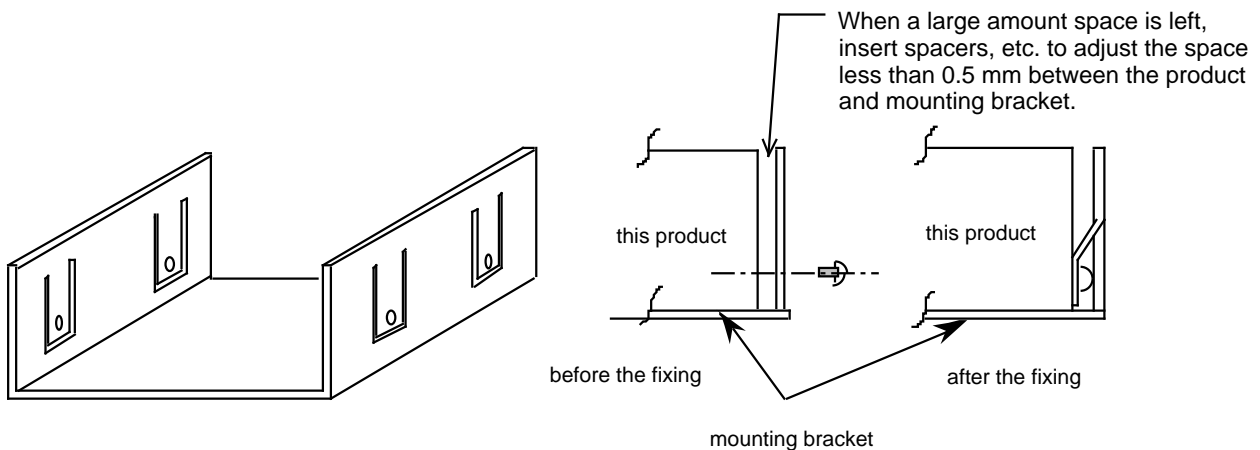after the fixing

mounting bracket

Fig.2

12. When mounting the product on other instrument, take care that the external surface temperature of the product does not exceed 55 °C.

13. In the instruction manual of your product, statement described in "Safety Instruction Manual "attached to this product, the statement of item 2,7 and 9 above, and other required statements should be mentioned for thorough understanding by the users.

Contents

1. Introduction

This document describes TOSHIBA's SD-M1401 DVD-ROM Drive.

This drive supports DVD CSS (Contents Scramble Systems) Disc.

This drive reads digital data stored on CD-ROM, DVD-ROM and CD audio discs.

DVD-ROM disc spec (DVD-ROM Book) defines 120 mm and 80 mm in diameter, single and dual layers as recording layer structure and single and double sides as recording side.

Maximum storage capacities are 4.38 GBytes and 15.9 GBytes for single layer/single side and dual layer/double side respectively. (1 GByte=2^{30} Bytes)

Due to these high capacity and high data transfer rate of 1352 KBytes/sec, DVD-ROM discs are capable to store high quality and long duration MPEG-2 moving picture data. (1 KByte=2^{10} byte)

This drive reads digital data stored on DVD-ROM discs at maximum 10 times faster rotaional speed.

This drive reads digital data stored on CD-ROM discs at maximun 40 times faster rotational speed.

This drive is a new generation drive with highest performance such as 105 ms(DVD)/85 ms(CD) Access Time.

This drive offers long life and durability because the disc is read by a LASER, thereby eliminating physical contact with the disc.

This drive supports SCSI synchronous transfer function and CD-DA transfer along subcode P,Q and R through W over SCSI function that host system can read CD audio data.

This drive shows a highest performance such as100,000 hour MTBF.

This drive can be used in a vertical position or horizontal position.

This drive adopts RPC-II for its "Standard Specification Model".

Refer to the precation of the next page for the RPC-II.

Matters to be attended to:

This drive adopts RPC-II for its "Standard Specification Model".

This DVD-ROM Drive adopts RPC-II, the Phase II System of RPC (Regional Playback Control), on the basis of a contract with the CSS (Contents Scramble System) organization.

The CSS rule requires that all the products not only DVD-ROM Drives but also PC systems installing DVD-ROM Drives sold from Jan.1, 2000 need to support RPC-II described above.

To playback a DVD-Movie Software with the Regional Code specified by using a DVD-ROM Drive with RPC-II adopted, either the hardware or software used as applications on PC system side is also required to meet RPC-II.

Namely, in the status that a hardware or a software for a DVD-Movie Playback Application planned to use in a PC does not support RPC-II, if the "RPC-II (Standard Specification) Drive" is used in combination, DVD-Movie Softwares with the Regional Code specified (most of DVD-Movie Softwares currently available on the market) cannot be reproduced.

Especially, changing the RPC-II specification drive to the RPC-I is prohibited by the CSS rule.

In the combination of the drive and PC system with RPC-II supported, as far as the Regional Code of a DVD-Movie Software and the code memorized in the RPC-II Specification Drive coincides, the Movie Software is allowed to carry out.

In the RPC-II Specification Drive, the region change by an end user is permitted up to 5 times in total including the initial region set. After change to the fifth region is carried out, the Drive enters Parm State ("no change allowed"status).

The drive with Parm State is permitted up to 4 times of "reinitialization" by a drive manufacturer or a specific service center authorized by the CSS. Since it is considered that the reinitialization is carried out after the completion of the region confirmation through test items in the PC manufacturer's manufacturing line or the completion of drive repair, etc., the number of reinitialization times may vary from 0 (no reinitialization available) to 4 times. So, we recommend that not to disclose the reinitialization process to end users but only to inform the number of region setting times as "end user's direct region setting is available up to 5 times in total."

2. Features

(1) Internal 12 cm/8 cm DVD/CD/CD-ROM Drive

(2) 5-1/4 inch Half Height Form Factor

(3) Fast 105 ms Random Access Time (DVD)

(4) Fast 85 ms Random Access Time (CD)

(5) 13,500 KByte/s max. (DVD)/6,000 KByte/s max. (CD) Sustained Transfer Rate (1 KByte = 2^{10} Bytes)

(6) CD Multisession Disc Spec (Photo-CD, CD-EXTRA) compliant

(7) CD-R and CD-RW Disc Spec. compliant (Read)

(8) Multimedia PC-3 Spec compliant

(9) Windows PC2000 Spec compliant

(10) RPC2 Compliant

(11)Tray Type Electrical Load/Eject

(12) Emergency Eject

(13) Slant Angle : Horizontal +/-20° Vertical 0/10° (side to side): +/-10° (front to rear)

   (In vertical mount, only 12 cm disc is applicable)

(14) Closed Enclosure

(15) Snap-on Bezel

(16) Built-in SCSI-2 interface Controller

(17) Sync-Transfer on SCSI Bus

(18) CD-DA Transfer Through SCSI Bus

(19) Subcode P,Q,R-W Transfer Through over SCSI

(20) CD Text Support

(21) Built-in Mode-1ECC and Mode-2EDC (DVD/CD-ROM)

(22) Embedded CD-ROM XA type ECC

(23) 128KBytes Data Buffer Capacity

(24) Media Removal Prevent Function

(25) CD-DA Transfer Through SCSI Bus (8.6X CLV)

(26) 8X Sampling & Digital Filter for CD Audio

(27) High Speed Audio Playback System

(28)16-Mode Output for CD Audio

(29) Software Volume Control (CD)

(30) 100,000 Power on Hours MTBF

(31) Easy Serviceability

(32) Remote SCSI-ID Jumper Block

(33) Built-in Terminator

(34) Low Power Consumption

   Ave: (CD) 10.8 W, (DVD) 7.2 W, Max : (CD) 12.6 W, (DVD) 8.8 W

   Stand-by 0.8 W

3. Specifications

3.1.Performance

(1) Applicable Disc *1	DVD: DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R (read)
	CD : CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, CD-I, CD-I Bridge (Photo-CD, Video-CD) Multisession CD (Phto-CD, CD-EXTRA, CD-R, CD-RW), CD-R (read), CD-RW (read)

(2) Data Capacity

User Data/Block   DVD-ROM: 2,048 Byte/Block
            CD-ROM : 2,048 Byte/Block (Mode 1)
                  2,336 Byte/Block (Mode 2)

Data Cpacity/Disc: (1 GB=2^{30} Byte, 1 MB=2^{20} Byte, 1 KB=2^{10} Byte)
          DVD-5 : 4.377 GB (4.700 Billion Byte)
          DVD-9 : 7.959 GB (8.545 Billion Byte)
          DVD-10: 8.754 GB (9.400 Billion Byte)
          DVD-18: 15.917 GB (17.091 Billion Byte)
          CD (Mode-1): 656.5 MB (688.4 Million Byte)
          CD (Mode-2): 748.8 MB (785.2 Million Byte)

(3) Rotational Speed

DVD	: Approx. 5,800 rpm (4.1-10X CAV)
DVD-R	: Approx. 1,100-2,800 rpm (2X CLV)
CD-ROM, CD-R	: Approx. 8,500 rpm (17.2-40X CAV)
CD-RW	: Approx. 4,300 rpm (8.6-20X CAV)
CD-DA Transfar	: Approx. 1,800-4,300 rpm (8.6X CLV)
CD-DA,Video-CD	: Approx. 1,200 - 2,000 rpm (4-5.7X PCAV)

(4) Transfer Rate
(1 KByte=2^{10} Byte=1,024 Bytes, 1 Mbyte=2^{20} Byte=1,048,576 Bytes)

Sustained Block Transfer Rate	DVD: 2,770-6,750 Block/s
	CD : 1,297-3,000 Block/s
Sustained Data Transfer Rate	DVD: 5,540-13,500 KByte/s
	CD : Mode 1 2,595-6,000 KByte/s
	Mode 2 2,959-6,843 KByte/s
Burst (SCSI Interface)	20 MByte/s (Sync)
	5 MByte/s (Async)

(5) Access Time

Average Random Access Time	DVD:[2]	105 ms Typ
	CD:[3]	85 ms Typ
Average Random Seek Time	DVD:[4]	100 ms Typ
	CD:[5]	80 ms Typ
Average Full Stroke Access Time	DVD:[6]	210 ms Typ
	CD:[7]	190 ms Typ

(6) Spin up Time (Focus Search Time and Disc Motor Start up Time)

DVD:	1.5 s Typ
CD:	1.4 s Typ

(7) Data Buffer Capacity   128 KByte

[1]: All disc written in CD or DVD formats, except CD Red Book (audio), require additional specific application software and/or hardware. This drive referred in the specification is capable of reading these data formats. However, in order to run applications that use these formats you must first have the required software and/or hardware.

[2]: Measured by performing multiple accesses which means reads of data blocks over whole area of the media from 0 (h) block to 1E7725(h) (4.089 Billion Byte:87 % of total area) block more than 3000 times. Includes positioning, setting, latency time and ECC implementation time (if required).

[3]: Measured by performing multiple accesses which means reads of data blocks over whole area of the media from 00 min 02 sec 00 Frame to 60 min 01 sec 74 Frame (552.96 Million Byte:87 % of total area at linear velocity of 1.3 m/s) more than 3000 times. Includes positioning, setting, latency time and ECC implementation time (if required).

[4]: Measured by performing multiple seek which means seeks of data block over whole area of the media from 0(h) block to 1E7725(h) block more than 3000 times. Includes positioning, setting time which is same definition as HDD.

[5]: Measured by performing multiple seek which means seeks of data block over whole area of the media from 00 min 02 sec 00 Frame to 60 min 01 sec 74 Frame more than 3000 times. Includes positioning, setting time which is same definition as HDD.

[6]: Measured by performing maximum accesses which means reads of each data block of 0 (h) block and 1E7725(h) block alternately more than 100 times. Includes positioning, setting, latency time and ECC implementation time (if required)

[7]: Measured by performing maximum accesses which means reads of each data block of 00 min 02 sec 00 Frame and 60 min 01 sec 74 Frame alternately more than 100 times. Includes positioning, setting, latency time and ECC implementation time (if required)

(8) Load/Eject	(a) Electrical Load/Eject (Eject Button)
	(b) Load/Eject by SCSI command
	(c) Emergency Eject
(9) Air Flow	Not Required
(10) Acoustic Noise	43 dB (IEC 179 A weighted at 1 m)
(11) Power Supply	+5 V , +12 V (details in Section 7)

3.2. Environmental Conditions
This drive should be used under the conditions listed below.

3.2.1. Temperature and Humidity
(1) Operating Temperature	5 °C to 50 °C
(2) Storage Temperature	-10 °C to 60 °C
(3) Shipping Temperature	-40 °C to 65 °C
(4) Operating Temperature Gradient	11 °C/hour (max)
(5) Storage Temperature Gradient	20 °C/hour (max)
(6) Shipping Temperature Gradient	20 °C/hour (max)
(7) Operating Humidity	8 % to 80 % (wet bulb 27 °C max)
(8) Storage Humidity	5 % to 95 %
(9) Shipping Humidity	5 % to 95 %
(10) Condensation	In all the above conditions there must be no condensation

3.2.2. Dust and Dirt
unspecified

3.2.3. Vibration
(1) Operating (1 Oct/min) ---------------- no hard error -----
10 to 500 Hz 2.45 m/s^2 [0.25 G] (0-p)
(excluding resonance point)

(2) Non-operating (1 Oct/min) --------- no damage -----
5 to 10 Hz 5 mm (p-p)
10 to 500 Hz 9.8 m/s^2 [1 G] (0-p)

(3) Shipping (Packaged) (1 Oct/min) ----- no damage -----
10 to 25 Hz 9.8 m/s^2 [1 G] (0-p)   X Y Z/30 min each

### 3.2.4. Atmospheric Pressure and Altitude
(1) Operating	0 to 3,000 m
(2) Shipping	0 to 12,000 m

3.2.5. Shock
(1) Operating (DVD/CD) -------------- no retry --------------
14.7 m/s^2 [1.5 G]   (Horizontal)
7.8 m/s^2 [0.8 G]   (Vertical)
(Half sine wave 11 ms/10s interval)

----------------------- no data loss --------------
98 m/s^2 [10 G]
(Half sine wave 11 ms/10s interval)

(2) Non-operating (with no Disc mounted) ----- no damage -----
490 m/s^2 [50 G]   (Half sine wave 11 ms)

(3) Drop (Packaged) ------------------ no damage -----
(a) Bulk package (15 pcs.)	1 drop at 0.4 m (Bottom side only)
(b) Bulk package (10 pcs.)	0.6 m drop once for each 6-surfaces, 1-edge and 1-corner
(c) Individual Package	0.9 m drops once for each 6-surfaces, 1-edge and 1-corner

3.3. Installation Conditions
Mount the drive within 20° of the horizontal positions and
within 10° of the vertical positions

+20°
-20°

+20°
-20°
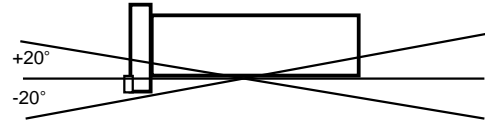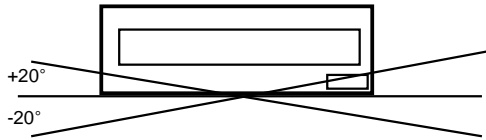
a) Horizontal position

+10°
0°

0°
-10°

+10°
-10°
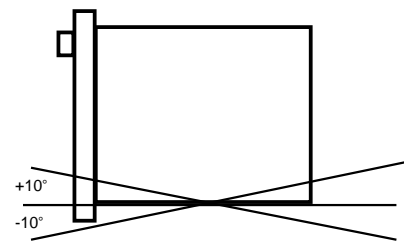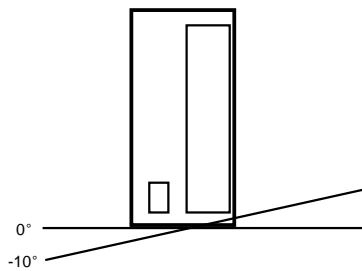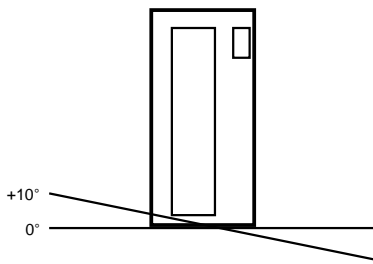
b) Vertical position

Figure 1 Installation position

3.4. Dimension and Mass   ----- See Figure 2 for details -----

    (1) External Dimensions (W x H x D)   146 mm x 41.5 mm x 193 mm (excluding bezel)

    (2) Mass (Weight)   0.95 kg (Net)
      1.4 kg (Individual packaged)
      10.8 kg (Bulk Packaged 10pcs.)
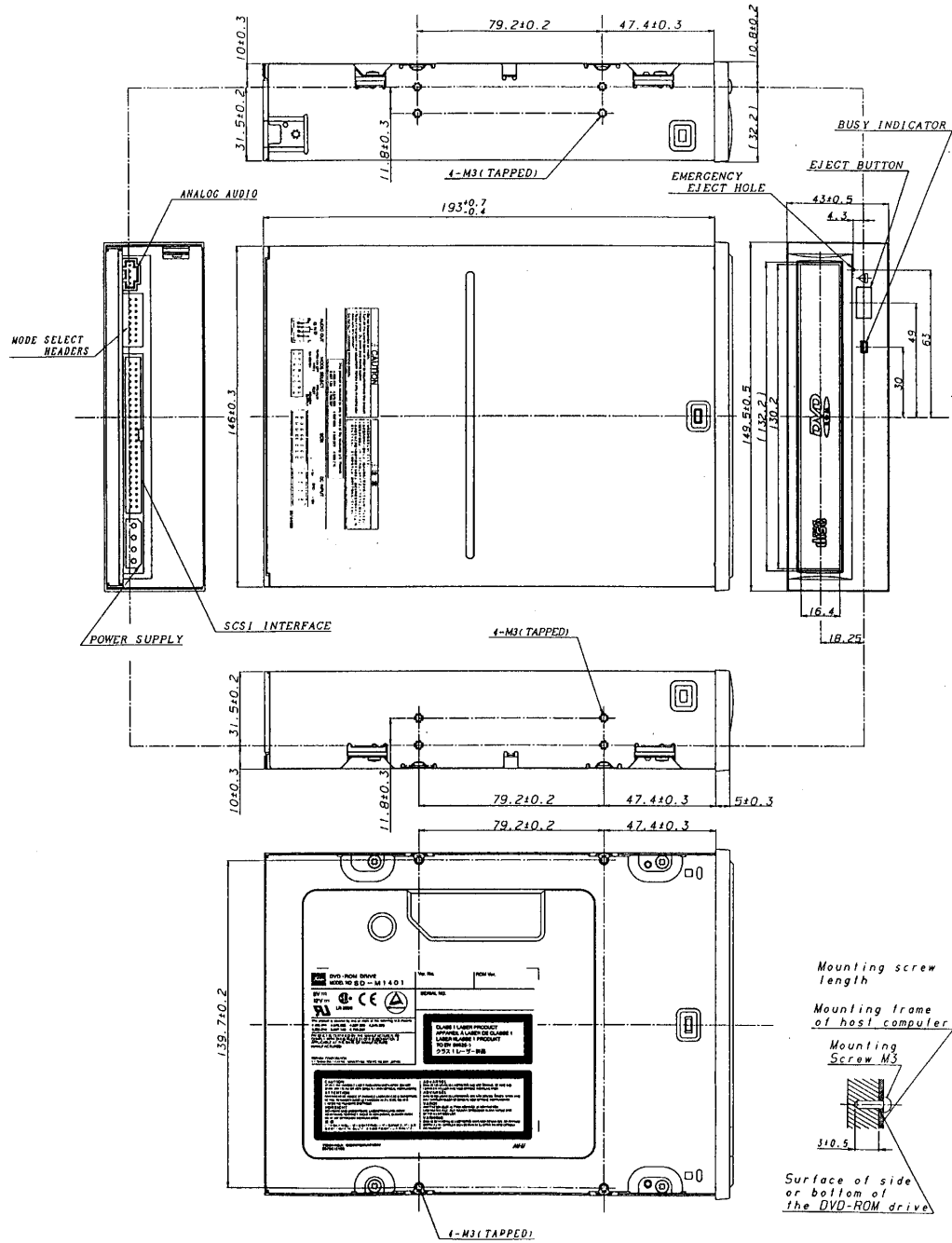   15.7 kg (Bulk Packaged 15pcs.)

Figure 2　External Dimensions (Unit: mm)

3.5. Reliabilites

3.5.1. Error Rate

(1) Hard Read Error Rate (Byte Error Rate) ----- Allowing 5 Retries(default) -----

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

(2) Seek Error Rate --- Allowing 5 Retries 10^{-6} Max
                   (default)

3.5.2. MTBF   100,000 h

Assumptions:	Power On Hours	5,436 h/year
	On/Off Cycles	313 cycles/year
	Number of Access	600,000 accesses/year
	Operating Duty Cycle	20 % of Power On Time
		(Reading/Seeking)

3.5.3. MTTR   0.5 h

3.5.4. Drive Life   15,000 h or 5 years (earlier one)

(1) Load/Eject   10,000 times or more
(2) Interface connector Attach/Detach   20 times or more
(3) DC Power connector Attach/Detach   20 times or more

4. Configuration

See Figure 3 for details of the configurations

4.1. Electrical Circuits

(1) Tray Eject Switch and Eject Detection Switch
(2) Optical Pickup Servo Drive Circuit
(3) Feed Motor Drive Circuit
(4) Laser Diode Control Circuit
(5) 8-16 Modulated data Demodulator, Error Correction Circuit and Disc Motor Control Circuit
    Copy Protector Circuit (DVD)
    (System Control Circuit, Digital to Analog Converter)
(6) EFM Demodulator, Error Correction Circuit and DA converter Circuit (CD)
(7) SCSI Control and CD - ROM Error Correction Circuit and SCSI I/O Interface Circuit

4.2. Optical Pickup   1-Lens and 2-Laser System

                                            Semiconductor Laser and 1-beam System (DVD)
                                            Semiconductor Laser and 3-beam System (CD)

4.3. Spindle Motor   Brushless DC Motor

4.4. Feed Motor   DC Motor

4.5. Tray Load/Eject Motor   DC Motor

DVD-ROM DRIVE MODEL SD-M1401 BLOCK DIAGRAM
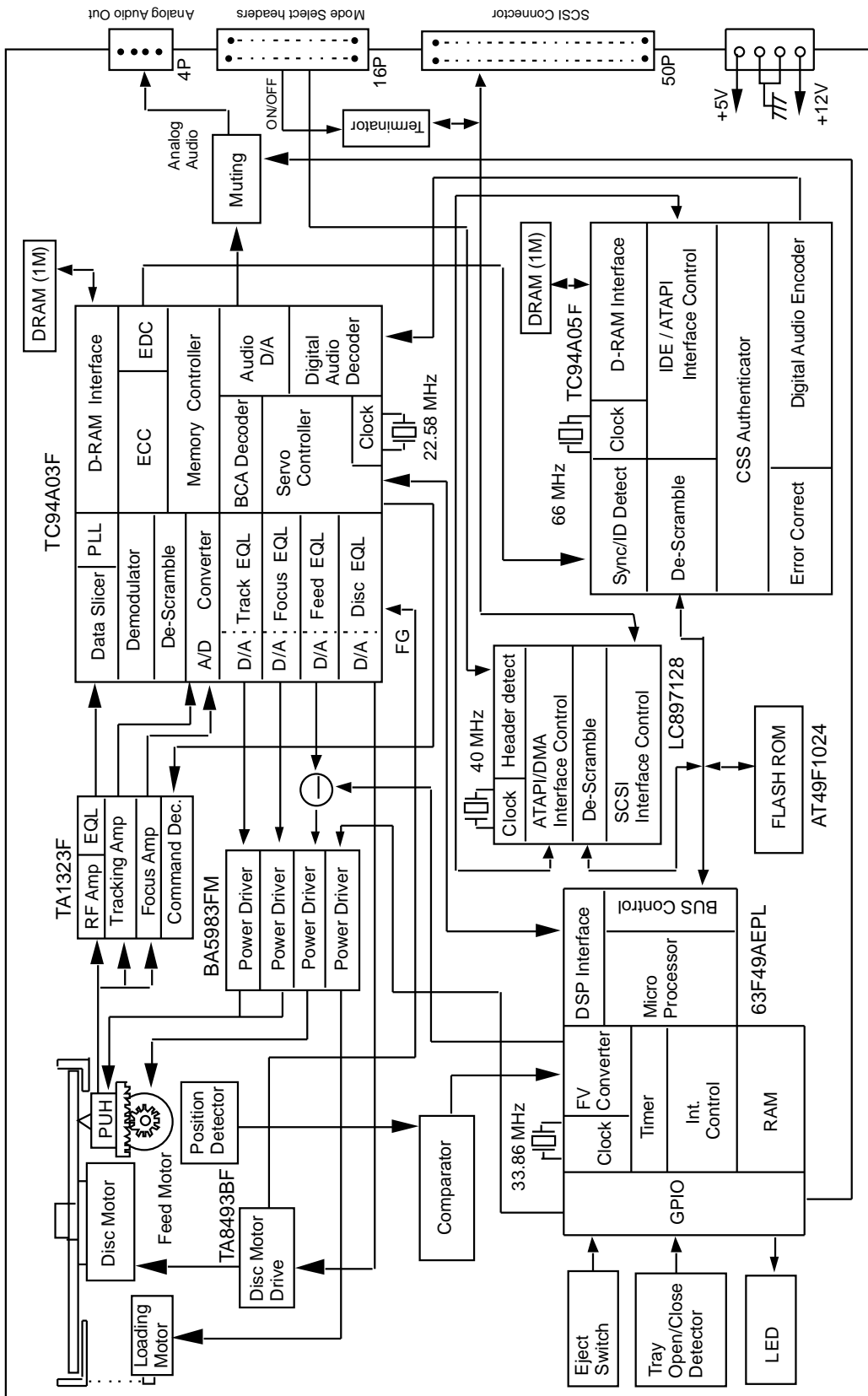
Figure 3 Configuration

5.Functions

5.1. Disc Data Configurations

5.1.1. DVD-ROM Data Configurations

Figure 4 shows how data is constructed in the case of dual layer/parallel track data DVD disc. The DVD spec defines the single layer, the dual layer/opposite and parallel track disc, that the DVD-ROM drive supports. For details refer to DVD Book Part 1.

1 block=1/676 s
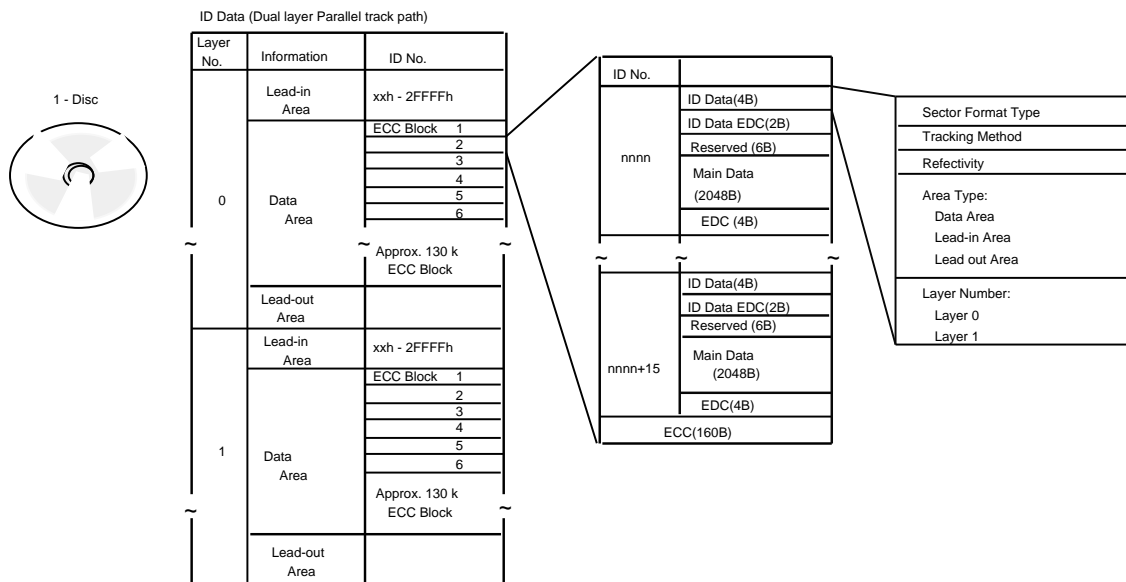

Figure 4 DVD-ROM Disc Data Configuration

5.1.2. CD-ROM Data Configurations

Figure 5 shows how the data is structured in program units
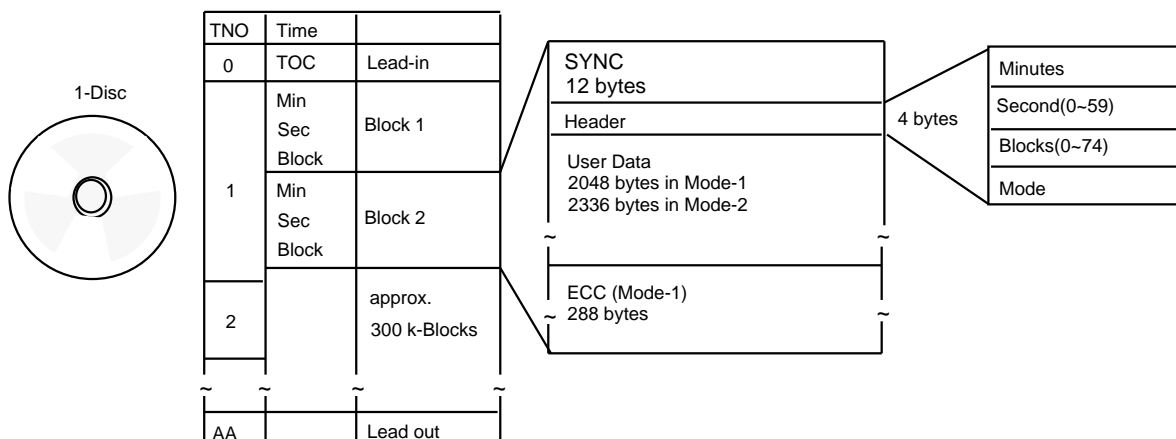
1 block=1/75 s

Figure 5 CD-ROM Disc Data Configuration

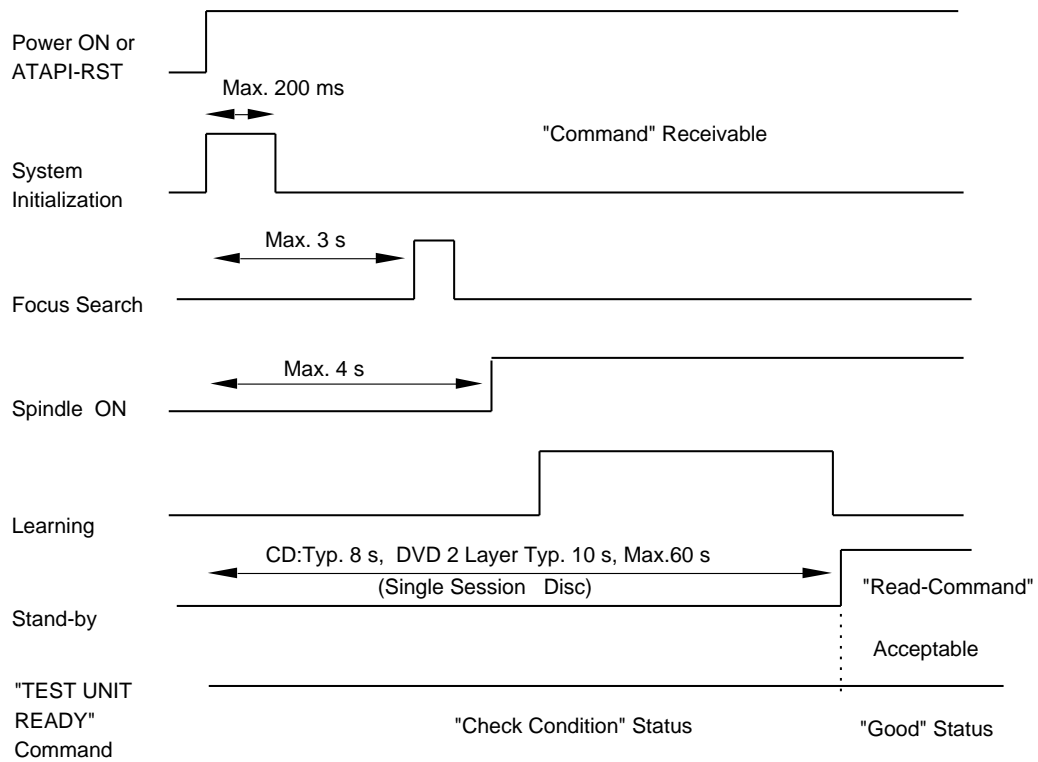### 5.2. Power ON/OFF Timing

Figure 6 shows the initialization sequence

Figure 6 Initialization Sequence

6. Interface

    (1) The interface is based on SFF8090 Ver.2, MMC revision 7.0C and SPC revision 3.

    (2) The drive supports SCSI synchronous transfer and CD-DA data transfer
       over SCSI function.

    (3) The 128 KByte data buffer handles both high and low speed data transmission.

    (4) The largest block size on playback is 2,647 Bytes (Including Error Flags)
       The data length for each block is changeable by command.

    (5) On command execution, DISCONNECT processing and RECONNECT processing
       can be specified.

    (6) Command Link functions are usable.

6.1. Signal Lines

    (1) Logical levels of every Inputs and Output are logically false signals
       Input Low = 0 to +0.4 V=Logic '1' (true)
       Input High = +2.5 V to +5.25 V=Logic '0' (false)
       Output Low >/= 48 mA
       Output High = Open collector (high impedance)

    (2) The Term Power line has a protection inside of the drive to protect the power supply.
       This is shown in Figure 7.
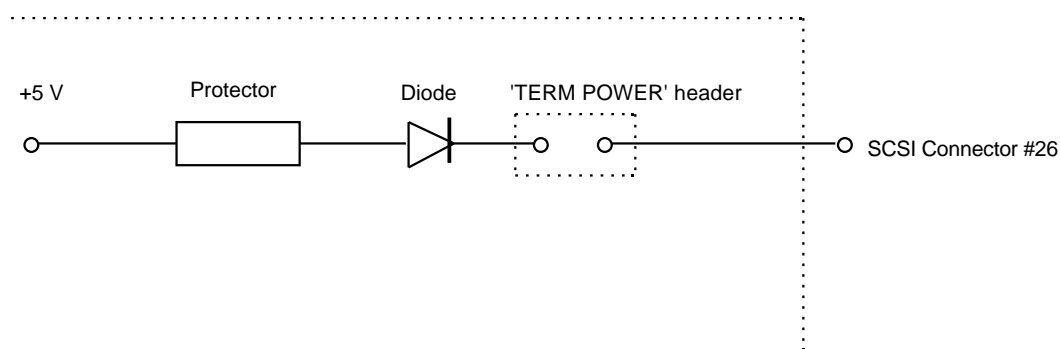
Figure 7 Power Supply Line

6.1.1. Signal Line Termination

    Figure 8 and Figure 9 shows the method for daisy chain connection and Figure 10 and
    Figure 11 shows the method for radial connection.
    Always connect the terminator for SCSI because of the open collector configuration
    output drive.
    Also be sure to attach the frame ground for grounding with the host system.

6.1.2. Receivers and Drivers

    Figure 12 shows the construction and Figure 14 shows the interface pin assignments.

6.1.3. Connector

    Figure 13 shows the details of connector and Figure 14 shows the interface pin assignments.
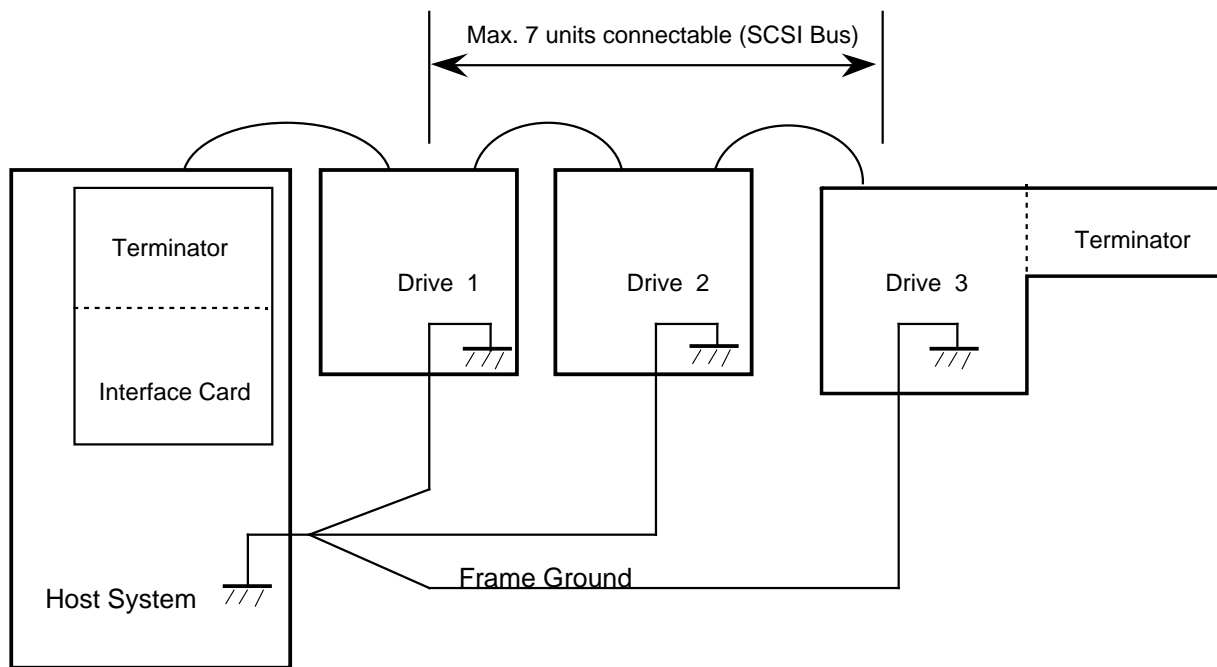
Figure 8 Daisy Chain Connection
-- Turn off Internal Terminators from the drive
if SD-M1401s are used as Drive 1 and/or Drive 2. ----
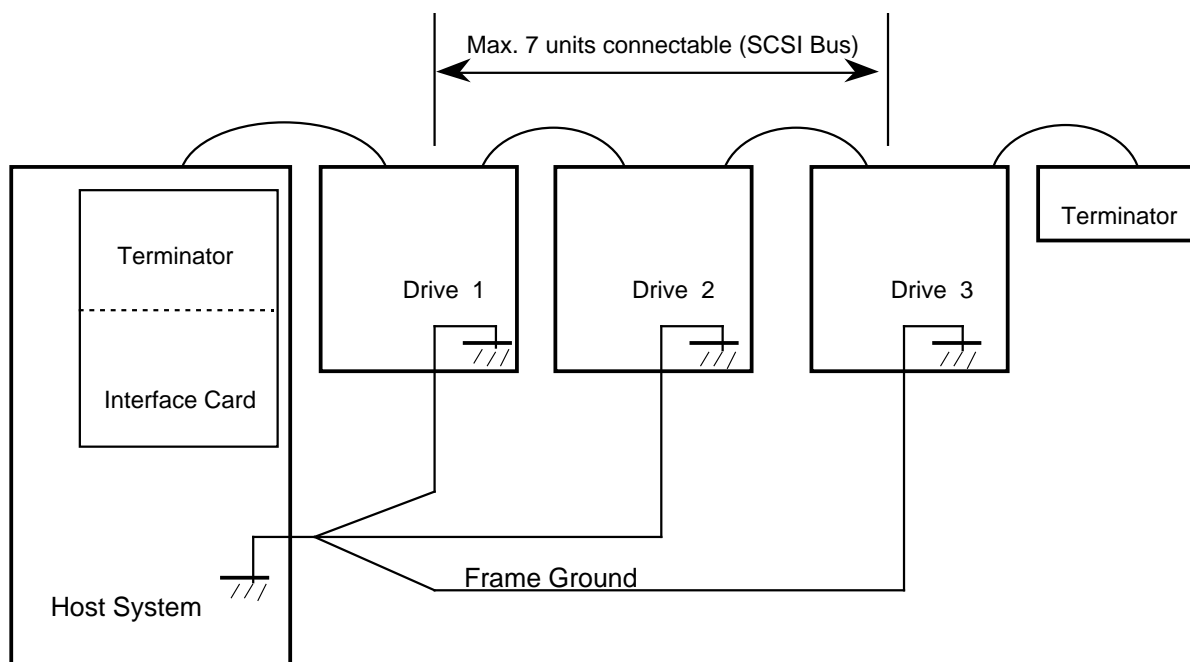
Figure 9 Daisy Chain Connection
--- Turn off Internal Terminators from those drives -----
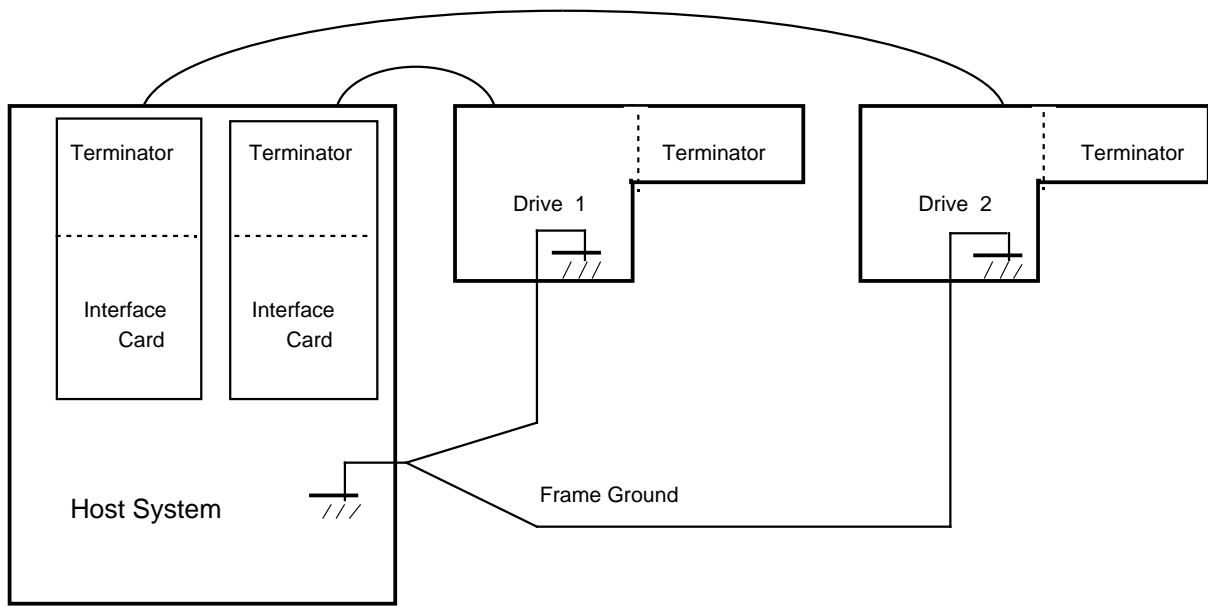
Figure 10 Radial Connection
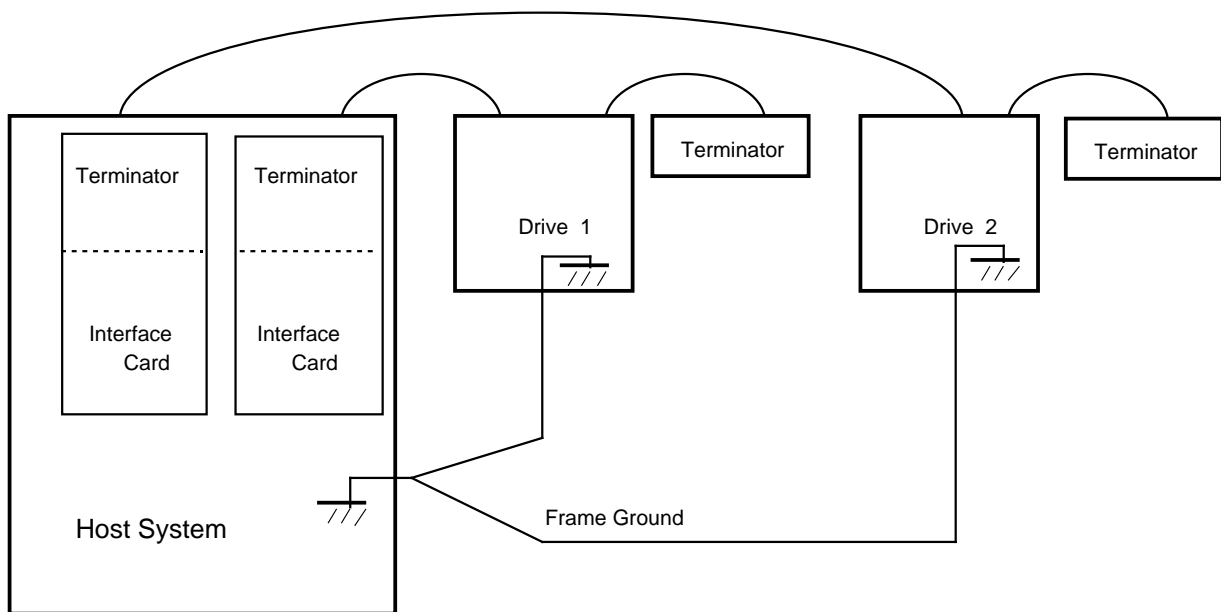
Figure 11 Radial Connection
----- Turn off Internal Terminators from those drives ---

　　　　　　　　　　　　　　　SD-M1401 Rev.1.0
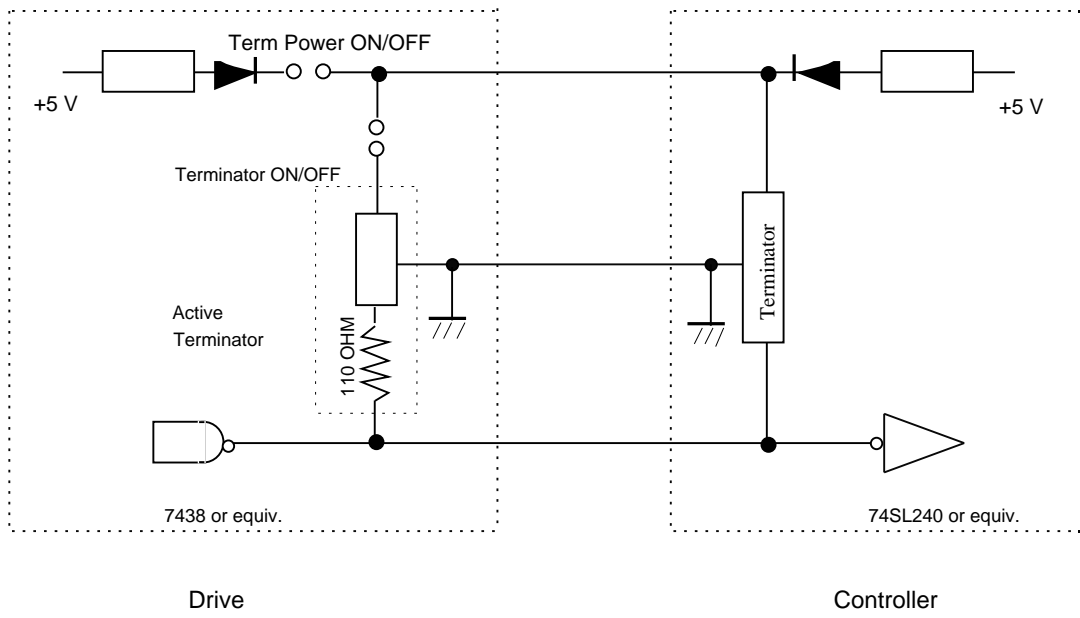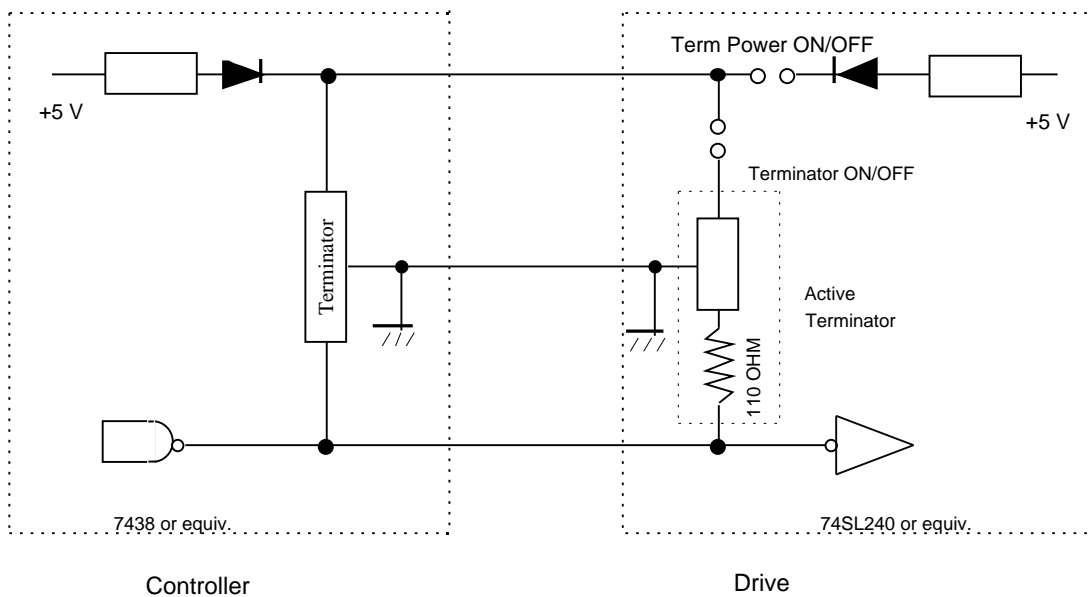
Figure 12 Receivers and Drivers
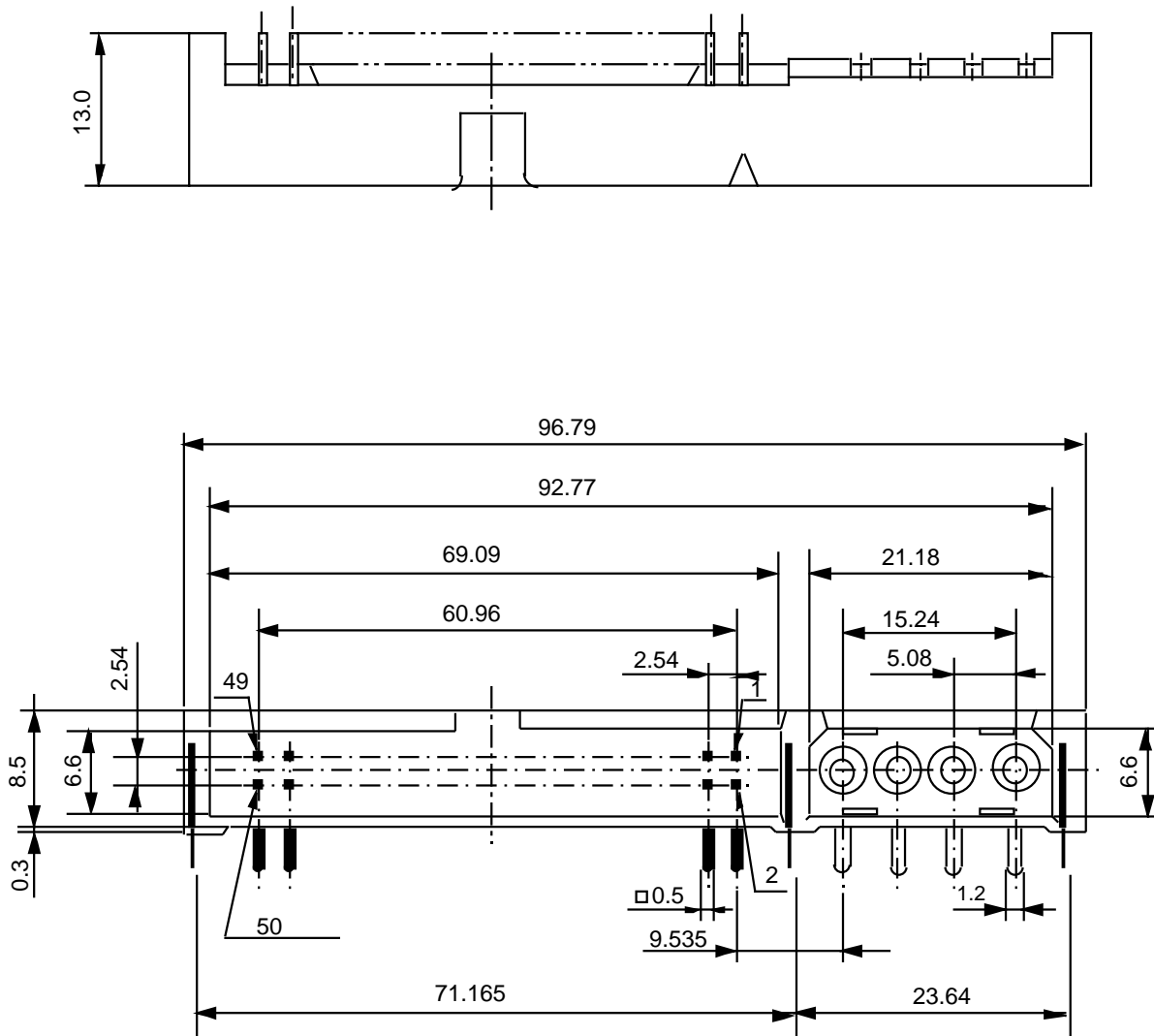
Figure 13 Interface Connector

PIN No	SIGNAL NAME	PIN No	SIGNAL NAME
2	-DB 0	1	GND
4	-DB 1	3	"
6	-DB 2	5	"
8	-DB 3	7	"
10	-DB 4	9	"
12	-DB 5	11	"
14	-DB 6	13	"
16	-DB 7	15	"
18	-DBP	17	"
20	GND	19	"
22	GND	21	"
24	GND	23	"
26	TERM POWER (+5 V)	25	NO CONNECTION
28	GND	27	GND
30	GND	29	"
32	-ATN	31	"
34	GND	33	"
36	-BSY	35	"
38	-ACK	37	"
40	-RST	39	"
42	-MSG	41	"
44	-SEL	43	"
46	-C / D	45	"
48	-REQ	47	"
50	-I / O	49	"

Figure 14 Interface Connector Pin Assignment

7. Power Requirements

7.1. Source Voltage   +5 V +/-5 % (Operating) +12 V +/-5 % (Operating)
                                          +/-8 % (Start up)   +/-8 % (Start up)

   7.1.1. Spike   100 mV (p-p) Max.

   7.1.2. Ripple   100 mV (p-p) Max.

7.2. Current Drain (Typical value)

	+5 V	+12 V
7.2.1. Sleep	130 mA (DVD/CD)	2 mA (DVD/CD)
7.2.2. Standby (Laser off, Motor off)	160 mA (DVD/CD)	3 mA (DVD/CD)
7.2.3. Continuous Read (Data/Audio)	610 mA (DVD) / 570 mA (CD)	320 mA (DVD) / 630 mA (CD)
7.2.4. Idle (Laser on, Motor on)	420 mA (DVD) / 410 mA (CD)	90 mA (DVD) / 110 mA (CD)
7.2.5. Average (20% Random Access)	560 mA (DVD) / 530 mA (CD)	370 mA (DVD) / 680 mA (CD)
7.2.6. Maximum (100% Random Access)	630 mA (DVD) / 590 mA (CD)	470 mA (DVD) / 800 mA (CD)
7.2.7. Peak in executing Access (Exclude Spike Current)	790 mA (DVD) / 730 mA (CD)	980 mA (DVD) / 1,570 mA (CD)

*Spike: Less than 1 ms of duration

7.3. Connector (SCSI and Power Hybrid type)
Figurer 15 shows the external appearance of the Power Supply Connector.
Use IRISO ELECTRONICS P/N9047B-54Z12-GT or equivalent.

PIN #1: +5 V
PIN #2: GND
PIN #3: GND
PIN #4: +12 V
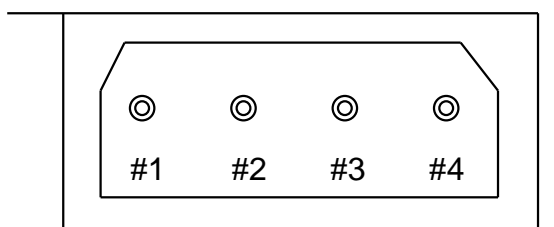
Figure 15 Power Supply Connector

8.Audio (Test condition:Ordinary temperature)

----- Specification for Red Book Disc -----

Output	: 2 channel (Analog Audio)
Sampling Frequency	: 44.1 kHz
Quautization	: 16 bit linear

8.1. Line Output --- in case of attenuator is set at 0 dB by the command ---

(1) Output Level	0.83 V (rms Typ)
(2) Type	Unbalanced
(3) Load Impedance	47 kOHM min
(4) Frequency Response	20 Hz to 20 kH +/-3 dB
(5) Distortion	-80 dB (at 1 kHz JIS A-weighted)
(6) Signal to Noise Ratio	90 dB Typ (IEC 179 A-weighted)

8.1.1.Connector

Figure 16 shows, the external appearance of the 4P Audio Connector
(Connector, Part No. 6156B-04A-PP, made by IRISO ELECTRONICS Corporation or equivalent
is used.)

PIN #1: L

PIN #2: GND

PIN #3: GND

PIN #4: R
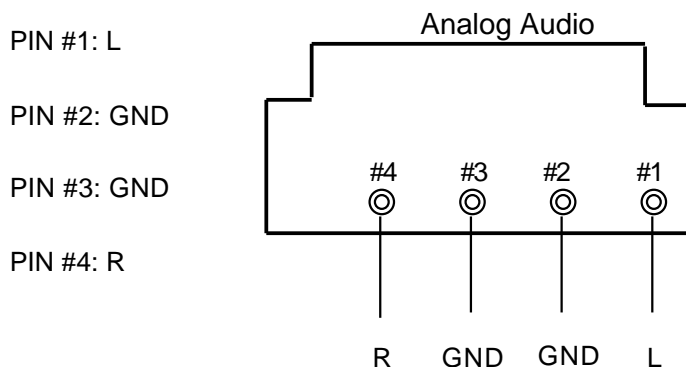
Figure 16 Audio Connector

8.2. Audio Modes

(1) 16 Modes including 'stereo', 'Lch Mono', 'Rch Mono', and 'Mute' are selectable by command.
Default mode is 'Stereo'. Audio out is automatically muted in the digital area and
seek state.

(2) 16 Steps of attenuation level for the Audio Output is selectable by command.
Default level is 0 dB.

9. Jumper Setting/Feature Selections

Set up of SCSI-ID number, Parity Check function, Host Interface Transfer Block Size function and CD-Audio Playback mode etc. are available by shorting these Headers.
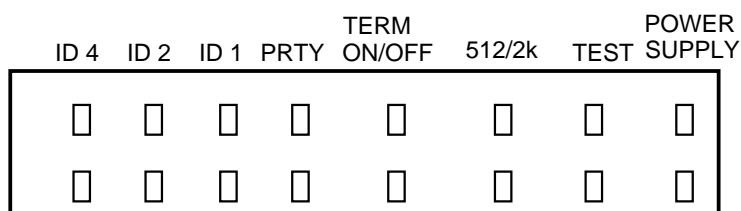
Figure 17 Mode Select Headers

9.1. SCSI-ID (ID 1, ID 2, ID 4) (Default ID)

This 3 bit binary header sets the SCSI-ID number.
When setting numbers, follow the application software instructions.

Header	LSB		MSB
SCSI-ID	ID 1	ID 2	ID 4
0	O	O	O
1	S	O	O
2	O	S	O
3	S	S	O
4	O	O	S
5	S	O	S
6	O	S	S
7	S	S	S

O: Open   S: Short

9.2. Parity (PRTY)

To enhance data bus reliability, set this Header to "S" to activate the parity bit check function on SCSI data bus.
This setting cannot be used if no parity generation function is provided on the I/F card.

Header	Description
O	The drive does not check parity although the output parity is effective.
S	The drive checks parity, and also the output parity is effective.

O: Open   S: Short

SD-M1401 Rev.1.0

9.3. Terminator ON/OFF (TERM ON/OFF)
This Head setting turn on or turn off the terminator.

Header	Description
O	The terminator is turn off.
S	The terminator is turn on.

O: Open   S: Short

9.4. Host Interface Transfer Block Size (512/2k)
This Head setting chooses 2048 Bytes Mode or 512 Bytes Mode on Host Interface transfer.

Header	Description
O	Allow 2048 Bytes Mode. (Support CD and DVD)
S	Allow 512 Bytes Mode . (Support only CD)

O: Open   S: Short

9.5. Audio Playback (TEST)
This Header setting selects the drive operation between normal CD-ROM and CD-Audio player mode. When "S" is selected, command from the host computer is ignored.
Also CD-Audio disc or audio tracks in CD-ROM disc is playable by the command when the Header is set for "0".

Header	Description
O	Normal operation mode to connect the host computer.
S	(ID 1, ID 2, ID 4 and PRTY Headers should be set for O) CD-Audio disc playback mode. Allows repeated play from beginning of the program area up to the last when the disc is loaded. Pushing the Eject Button for shorter than 1 s allows proceeding to beginning of the next track number but not acceptable during access. Pushing the button more than 2 s stops playing and ejects the Tray.

O: Open   S: Short

9.6. Terminator Power Supply (POWER SUPPLY)

This header setting switches to supply the power (+5 V) to the other equipments through the SCSI connector or not.

Header	Description
O	No power is supplied from the drive.
S	Power is supplied to the other peripherals through SCSI Connector (Pin No. 26).

O: Open   S: Short

9.7. Jumper (Part Number T/E)

Use P/N 9251H-GF made by IRISO Electronics or equivalent.

9.8. Recognition of Setting

As the setting recognition is performed only after power On, turn power off and then On again whenever change is made.

10. Busy Indicator

The LED of Front Bezel indicates the drive status. (Busy Indicator)

(1) After Tray is closed, Busy Indicator start blinking at 0.8 s intervals, and then -----

(1-1) Turns off when the drive in the 'Idle' status.

0.8 s

Light Off
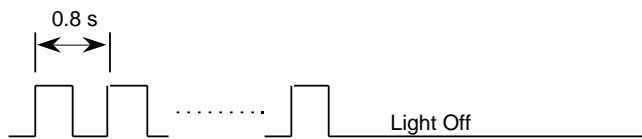
Figure 18 Idle

(1-2) Continuously off when no disc is mounted.

0.8 s

Light Off
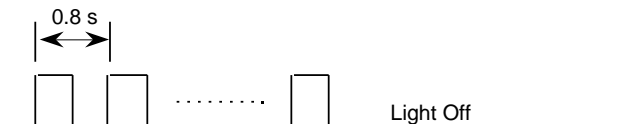
Figure 19 No disc

(1-3) Continuously on when media has problem

0.8 s

Light On
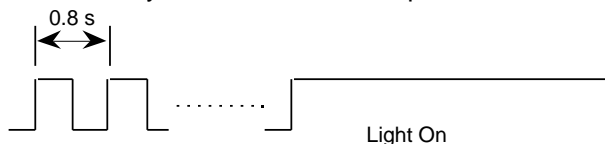
Figure 20 Media Problem

(2) When playing an audio track, Busy Indicator is blinking at 1.6 s intervals.

1.6 s
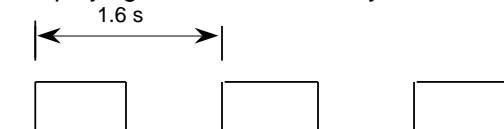
Figurer 21 CD-Audio playback

(3) When performing 'Data Access' and during 'Data Transfer' Busy Indicator keeps turn On.

Light On
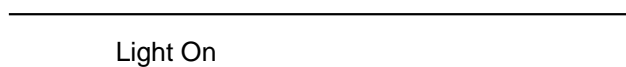
Figurer 22 Data Access and Data Transfer

11.Connection

11.1. Power Supply Cable
    (1) Housing   AMP JAPAN P/N 1-480424-0 or equivalent
    (2) Contact   AMP JAPAN P/N 170148-2 or equivalent
    (3) Cable Length   AWG 28
                                    Max. 2 m

11.2. Interface Cable
    (1) Connector   SCSI specification
    (2) Cable   50 core type
       Specific Impedance   100 OHM +/-10 % (without shield)
        Length   Max of 6 m for total SCSI bus length
                                      Max of 3 m for total SCSI bus length (FAST SCSI)
                                      Max of 1.5 m for total SCSI bus length (Ultra SCSI)

11.3. Audio Cable   Unbalanced and shielded
    (1) Capacitance   Less than 1000 pF
    (2) Length   Max. 3 m

12.Emergency Eject

Execute following procedure only in the case of emergency (Tray will not eject and disc can not be removed although pressing Eject Button).
(1) Turn the drive supplying power off.
(2) Insert solid bar (like paper clip) into Emergency Eject hole and push as shown in Fig.23. Then Tray will be ejected.
(3) After removed the disc, gently push Tray to close.

50 mm
diameter 1.0 to 1.5 mm
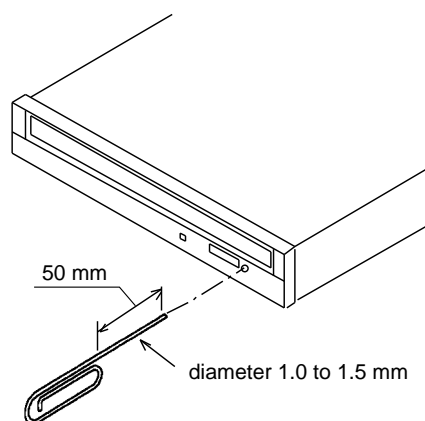
Figurer 23 Insert the bar

13.Safety Standards/Agency Approvals

(1) Safety   EN60950
                               UL 1950
                               CAN/CSA-22.2 No.950
(2) Laser   FDA CFR21, EN60825

(3) CE   EN50081-1   : 1992 [Residential, commercial & light industry]
                               EN55022   : 1998 [Class B (inclding domesstic enviroment)]
                               EN55024   : 1998 [Information technology equipment-Immunity
                                                     characteristices - Limits and methods of
                                                     measurement]
                               EN61000-4-2+A1 : 1995+1998 [CD:4 kV, ID: 4 kV, AD:8 kV]
                               EN61000-4-3   : 1996 [3 V/m, 80-1000 MHz, 1 kHz 80 % AM]
                               EN61000-4-4   : 1995 [AC-line: 1 kV, I/F 0.5 kV, f: 5 kHz, Polarity: +/-]
                               EN61000-4-5   : 1995 [AC-line: 2 kV/1 kV, Polarity: +/-]
                               EN61000-4-6   : 1996 [3 V, 0.15-80 MHz, 80 % AM]
                               EN61000-4-8   : 1993 [1 A/m, 50 Hz]
                               EN61000-4-11 : 1994 [>95 % 0.5, 30 % 25, >95 250]

14. Electrostatic Discharge

Standard   IEC801-2
(1) Operating   8 kV or less
(2) Damage including   15 kV or more

15. Accessories

                               1-Safety Instruction Manual
                               5-Short Jumper (Installed in 'TERM' header and GND to GND)

16. Packaging

(1) 15 unit in a bulk package   24 bulk packs on one pallet.
                                        *All transportation is allowed with pallet.
                                          (Transportation with bulk package is not allowed.)

(2) 10 unit in a bulk package   28 bulk packs on one pallet.
                                          (Transportation with bulk package is allowed.)

17. CE Declaration of conformity
Please refer to attached Annex 1.

TOSHIBA

TOSHIBA EUROPE GMBH

EU-Declaration of Conformity

Product: DVD-ROM Drive

Manufacturer(s):   Toshiba Corporation
                                             1-1, Shibaura 1-chome, Minato-ku, Tokyo 105-8001 Japan

                                             See page 2 for other locations

Model: SD-M1401

Options: None

**Toshiba declares that the above mentioned product(s) with or without
the listed options comply to the EU-Directives and standards as listed on page 2.**

Last two digits of the year in which the CE mark affixed : 00

Responsible for CE-marking: Toshiba Europe GmbH

Signed by: Mr. F.Yamashita, President of Toshiba Europe GmbH

Place: D-41460 Neuss

Date: March 10,2000

Signature: ---

This declaration certifies compliance with the listed directives, but does not constitute an
assurance of characteristics.
The safety information in the supplied product documentation must be observed.
....
Document No.:   **YEA-R150**   **Page: 1 of 2**
....

[History if issue]   Issued   : Mar.9, 2000
                                      ……………………………………
                                      Revision A   :   Ref.:
                                      ……………………………………   ………………………
                                      Revision B   :   Ref.:
                                      ……………………………………   ………………………
                                      Revision C   :   Ref.:
                                      ……………………………………   ………………………
                                      Revision D   :   Ref.:
                                      ……………………………………   ………………………

Annex 1

EU-Declaration of Conformity

ED-Directive	Related Standard		Issude	Level/Test condition
899/336/EEC (EMC Directive)	EMC-emission:	EN50081-1	1992	Residential, commercial & light industry
		EN55022	1998	Class B (incling domestic enviroment)
		EN55024	1998	Information technology equipment-Immunity characteristices-Limits and methods of measurement
	EMC-immunity	EN61000-4-2+A1	1995 +1998	CD: 4 kV, ID: 4 kV, AD: 8 kV
		EN61000-4-3	1996	3 V/m, 80-1000 MHz, 1 kHz 80 % AM
		EN61000-4-4	1995	AC-line: 1 kV, I/F 0.5 kV, f: 5 kHz, Polarity: +/-
		EN61000-4-5	1995	AC-line: 2 kV/1 kV, Polarity: +/-
		EN61000-4-6	1996	3 V, 0.15-80 MHz, 80 % AM
		EN61000-4-8	1993	1 A/m, 50 Hz
		EN61000-4-11	1994	>95 % 0.5, 30% 25, >95 250

Product/Options	Model	Related EU-Directive 89/336/EEC
DVD-ROM Drive	SD-M1401	X

Manufactuer(s) Location / Address

Manufactuer(s) Location	Address
Toshiba Multi Media Devices Co, Ltd	19 Minase, Fukihata Goshogawara-shi, Aomori 037-0003 Japan
Toshiba Misawa Media Devices Co, Ltd	3-31-2779, Minami-cho, Misawa-shi, Aomori-ken 033-0036 Japan
EMS Corp.	4-5 Shoubu, Ubayachi Goshogawara-shi, Aomori 037-0015 Japan
Hokuto Communication Industrial Co., Ltd.	207 Aza Koamon, Rokugo, Rokugo-machi, Senboku-gun, Akita 019-1404 Japan
Yuzawa Denshi Kogyo Co., Ltd.	257 Nakano Yuzawa-shi, Akita 012-0041 Japan
Tsugaru Technica Co., Ltd.	81-87 Iwai, Aiuchi, Shiura-machi, Kitatsugaru-gun, Aomori, 037-0401 Japan
Emusu Itayanagi Co., Ltd.	13-10, Matsumoto, Tsuji, Itayanagi, Kita-Tyugaru-gun, Aomori, 038-3645 Japan
Toshiba Information Equipment (Philippines) Inc	103 East Main Avenue Extension, Special Export Processing Zone, Laguna Technopark, Binan, Laguna Philippines
Integrated Microelectronic Inc.	North Science Avenue Laguna Techno Park Inc. Binan, Laguna Philippines
EMS Kizukuri Corp.	1-2 Aza-Miyazaki, Kizukuri-machi, Nishi-Tugaru-gun Aomori 038-3157 Japan
EMS Fukaura Co., Ltd	24-1 Aza Azumazawa, Ohaza Fukaura, Fukaura-machi, Nishi-Tsugaru-gun, Aomori, 037-0401 Japan

Document No.: YEA-R150   Revision:

Page: 2 of 2

TOSHIBA

Deviation List

Page	Item	Rev # 0.8	Rev # 1.0
3	2. Fuatures	(4) Fast 80 ms Random Seek	(4) Fast 85 ms Random Access
8	Figure 2	TENTATIVE	Non-tentative
21	9. Jumper Setting	Set up of........, Eject Button inhibit function and CD-Audio	Set up of........, Host Interface Transfer Block Size function
	Figure 17	PRV/ALW TERM POWER	512/2K POWER SUPPLY
22	9.4. Host Interface Transfe...	9.4. Media Eject Prevention (PRV/ALW)	9.4. Host Interface Transfer Block Size (512/2k)
	9.4. Host Interface Transfe...	This Head setting enables or	This Head setting chooses 2048 Bytes Mode......
	Header		
	O	Allow the Tray eject	Allow 2048 Bytes Mode (Support CD and DVD)
	S	Prevent the Tray eject. Eject button is ignored.	Allow 512 Bytes Mode (Support only CD)
23	9.6. Terminator Power Supply	9.6. Terminator Power Supply (TERM POWER)	9.6. Terminator Power Supply (POWER SUPPLY)