Registration No. A260-E01

Preliminary

SPECIFICATIONS
FOR Blu-ray DISC DRIVE

DATE OF ISSUE : February 23. 2011

MODEL : UJ260ABNC-B

Rev . 0.10

RECEIVED
DATE :

Comment :

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Check (Plannig)	Approval (Engineer)	Check (QA)	Check (Legal)	Design

History

Parts No. : (PSN) UJ260ABNC-B
(Customer)

Spec Rev.	ECN Number	Date	Drive Rev.	FW Rev.	Box Rev.	Phase in /Period	Comments
0.10	-	2011/2/23	-	-	-	-	

Contents

1.Applications

a) This specification describes the general specs and performance of BD Drive UJ260.

b) In case major modification to improve performance and in the event that the device does not perform as specified, the stipulation requires that modification and solution should be made with mutual discussion, following the stipulations stated in this specification.

c) Some components which are different in appearance and performance may be mixedly used owing to multiple sourcing and owing to common use with different models caused by decreased production quantity.

d) Product to be marked which is compatible HHS Class 1 Standard in the USA.

e) In the process of manufacturing of the products including packaging, any materials related ozone destructive items are not used at all.

f) PSN in this document stands for Panasonic System Networks Co., Ltd.

g) Special clause.
We will endeavor to do our best for maintaining the control of quality, however,

1) We want you to confirm the safety of the product in which PSN product is incorporated.
If there is a problem with our product, be requested to advice the problem before shipment to the market.
:Be requested to do the test for confirmation of the product which installs PSN product, following applicable rules and regulations.
:Be requested to confirm the safety from abnormal usage under the condition installed.
:Be requested to confirm the safety for reliable test under the condition installed.

2) Be requested to provide necessary information how to use and how to install to the customers with the expectation that minimize unexpected accident from unexplained specification in this stipulation.

3) In case, owing to the quality problem from this product, if there is a possibility to endanger the life of the user or property, please be requested to take double safety counter-measures by having enough tolerance over the assured specification and performance stated in this spec. from the point of product liability issue.

4) Transcription and duplication of this document without prior consent is prohibited.

5) Duration of limited warranty is 15 months after date manufactured.

6) Duration of repair is 3 years after the following month of the end of manufacturing.

7) Our trademark "Panasonic" shall not be printed on any products according to our mutual consultation between customer and Panasonic.

2.Features

1) Builtin Type for PC

2) Read speed

DVD-ROM	:Max 8X CAV
CD-ROM	:Max 24X CAV
BD-ROM	:2.0x CLV(for Video)/Max 6X CAV(for Data)

3) Maximum Write speed

CD-R	:Max.24X CAV
CD-RW	:4X CLV
High Speed CD-RW	:10XCLV
DVD-R	:Max.8X CAV
DVD-R DL	:Max.6X Zone CLV
DVD-RW	:Max.6X Zone CLV
DVD+R	:Max.8X CAV
DVD+R DL	:Max.6X Zone CLV
DVD+RW	:Max.8X Zone CLV
DVD-RAM	:3X-5X PCAV (4.7GB)
BD-R (SL/DL)	:Max.6X CAV
BD-R (TL/QL)	:Max.4X Zone CLV
BD-RE (SL/DL/TL)	:2XCLV

4) Support Buffer Underrun Free Recording

5) Single +5V Power Supply

6) Zero Power(Device Attention with eject button) supported

7) The media for write check

CD-R	:TAIYO YUDEN Co.,Ltd. ,Mitsubishi Kagaku Media Co., Ltd. , Hitachi Maxell,Ltd.
CD-RW	:Mitsubishi Kagaku Media Co., Ltd.
HS CD-RW	:Mitsubishi Kagaku Media Co., Ltd.
DVD-R	:TAIYO YUDEN Co.,Ltd.
DVD-R DL	:Mitsubishi Kagaku Media Co., Ltd.
DVD-RW	:Victor Company of Japan, Ltd. (JVC) , Mitsubishi Kagaku Media Co., Ltd.
DVD+R	:Mitsubishi Kagaku Media Co., Ltd.
DVD+R DL	:Mitsubishi Kagaku Media Co., Ltd.
DVD+RW	:Mitsubishi Kagaku Media Co., Ltd.
DVD-RAM	:Panasonic Corporation , Hitachi Maxell,Ltd.
BD-R	:Panasonic Corporation
BD-RE DL	:Panasonic Corporation
BD-RE TL	:Panasonic Corporation

8)Access Speed

DVD-ROM SL	190ms (Typ.)	(Random)
CD-ROM	180ms(Typ.)	(Random)
BD-ROM SL	300ms(Typ.)	(Random)

3.Write Speed

The drive adjusts the write speed to the disk charactaristics.

The optimal write speed to the disk may not be the maximum write speed.

4. Specifications

NO	Item	Specification	Condition
4-1	Power Supply		
	1.Operating Voltage	DC 5 V +/- 0.25V	
	2.Power Consumption	Peak 1800 mA (Max.)	Except inrush current (Less than 1ms)
		Read (CD) 1100 mA (typ.)	CD(MNSU-006)
		Read (DVD) 950 mA (typ.)	DVD(KME-DVD001)
		Read（BD） 950mA (typ.)	BD-RE SL Full write Media
		Write 1350 mA (typ.)	CD-R/DVD-R/BD-RE Max. Write
		Standby 50 mA (typ.)	Slumber mode
	3. Ripple	100 mVp-p Max.	
4-2	Drive		
	1.Transfer Rate		
	(1) Read		
	DVD-ROM	MAX 8X CAV (MAX 10800 kB/s)	
	CD-ROM	MAX 24X CAV (MAX 3600 kB/s)	
	BD-ROM	MAX 6X CAV (MAX 27 MB/s)	
	(2) Write		
	CD-R	4X (CLV), 8X (CLV), 24X (CAV)	
	CD-RW	4X (CLV)	
	HS-RW	10X (CLV)	
	8cm media	4xCLV	(CD series)
	DVD-R	2X(CLV),MAX. 4X (ZCLV), MAX.8X (CAV)	DVD-R for General
	DVD-R DL	2X(CLV),MAX.4X/6X(ZCLV)	
	DVD-RW	1X(CLV), 2X(CLV),MAX.4X/6X(ZCLV)	
	DVD+R	2.4X(CLV),MAX.4X (ZCLV), MAX.8X (CAV)	
	DVD+R DL	2.4X(CLV),MAX.6X(ZCLV)	
	DVD+RW	2.4X(CLV), 3.3X(CLV), MAX.4X /8X(ZCLV)	
	DVD-RAM	2X (CLV), 3X (CLV), 5X (PCAV)	4.7 / 9.4 GB
	8cm media	2X(CLV), 2.4X(CLV)	(DVD series)
	BD-R SL	2X (CLV), MAX.4X(ZCLV/PCAV),MAX.6X (CAV)	
	BD-R DL	2X (CLV), MAX.4X(ZCLV/PCAV),MAX.6X (CAV)	
	BD-R TL	2X (CLV), MAX.4X(ZCLV)	
	BD-R QL	2X (CLV), MAX.4X(ZCLV)	
	BD-RE SL	2X (CLV)	
	BD-RE DL	2X (CLV)	
	BD-RE TL	2X (CLV)	
	(3) SATA Interface	150 Mbyte/s	
	2.Buffer Memory	2MB	
	3.Error Rate		
	(1) CD-ROM(with ECC)	less than 10^{-12} bit	<Access Time>
	(without ECC)	less than 10^{-9} bit	using PSN's original test
	(2) DVD-ROM	less than 10^{-12} bit	program and
	(3) BD-ROM	less than 10^{-12} bit	
	4.Access Time	DVD-ROM 190 ms typ.(Random)	DVD(KMEDVD001)
		CD-ROM 180 ms typ.(Random)	CD(MNSU-006)
		BD-ROM 300mstyp.(Random)	BD-RE SL Full write media
	5.Start up Time	less than 15s	Except Multi Session and Writable Media
	6.Stop Time	less than 6s	
	7.Acoustic Noise	less than 50 dBA	ISO/JIS7779 (ANSI)
	8.Interface	SATA Interface	
	9.Regional Code	"None"	
	10.Inquiry Data	"BD-MLT UJ260"	

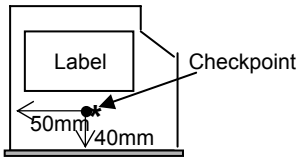
4. Specification (continue)

NO	Item	Specification	Condition
4-3	Applicable disc	C D: CD-ROM（12cm,8cm） CD-R,CD-RW DVD: DVD-ROM,DVD-R,DVD-R DL DVD-RAM,DVD-RW DVD+R, DVD+R DL,DVD+RW BD: BD-ROM,BD-R,BD-RE	Except abnormal shaped Disc
4-4	Applicable disc format	CD: CD-DA,CD-ROM,CD-ROM XA PhotoCD(muiltiSession) Video CD,CD-Extra(CD+),CD-text Hybrid SACD DVD: DVD-VIDEO, DVD-ROM, DVD-R(4.7GB), DVD-RW(Ver.1.1/1.2) , DVD-RAM DVD+R, DVD+R DL, DVD+RW DVD-R DL(Format1/4) BD: BD-ROM(1.3), BD-R(1.3/2.0),BD-RE(2.0/3.0)	CD Layer only Format 1/4 Write support
4-5	Slope	Horizontal Only	
4-6	Dimensions, Weight	128 x 129 x 12.7 mm (W x D x H) (except protrusion) 185 g +/- 10g	Upper cover-AL Bottom cover-AL (T.B.D.)
4-7	Eject	Soft Eject (with emergency eject hole)	

5. Appearance

NO	Item	Specification
5-1	Appearance	- Any remarkable scratches, stains, sink mark, haze and burrs which degrade cosmetic are not allowed. - We may not accept it as custom components except front bezel. - No discoloration is allowed. - No contamination or objection lens or pick-up cover are allowed. - Marginal one will be judged by limitation samples which mutually agreed by both parties. - Front bezel Green LED indicator

6. Reliability

NO	Item	Specification	Condition
6-1	Temperature	Operating guarantee : 5 to 50℃ Non operating : -20 to 60℃ Recommended position of temperature mesurment in the case drive is built in to the PC. (at the point "*" in the right figure) Operating guarantee temperature : 55℃	
6-2	Humidity	Operating gurarantee : 10 to 80% RH Non operating : 5 to 90% RH	The maximum wet-bulb temperature is 31℃
6-3	MTBF	60,000h (Duty : 20 %)	
6-4	MTTR	30min	

7.Safety

NO	Item	Specification	Condition
7-1	Safety	UL/cUL (UL 60950-1 CSA C22.2 No. 60950-1) TUV (EN 60950-1)	
7-2	EMC	CE Marking (EMC Directive 2004/108/EC) EN 55022 EN 55024	
7-3	LASER	21 CFR Subchapter J (Class 1 laser product) IEC 60825-1/EN 60825-1 (Class 1 laser product)	

Note : This model is compliant to HHS and EN60825-1 as Class 1 Laser, so information of laser must be presented in user instruction or operation manual which is supplied to end user.
Information for laser : Refer to the attached sheet.

8.Shock/Vibration

NO	Item	Specification	Condition
8-1	Shock 1.Operating :Read :Write 2.Non Operating	 19.6m/s^2 (2.0 G) (11ms X,Y,Z) : CD-DA 58.8m/s^2 (6.0 G) (11ms X,Y,Z) : CD-ROM/DVD-ROM/BD-ROM 4.9m/s^2 (0.5 G) (11ms X,Y,Z) 588m/s^2 (60.0 G) (11ms X,Y,Z) 1960m/s^2 (200 G) (2ms X,Y,Z)	CD-DA CD-ROM/DVD-ROM/BD-ROM CD-DA:Not irregular sound CD-ROM:possibility of retry DVD:possibility of retry BD:possibility of retry
8-2	Vibration 1.Operation :Read :Write 2.Non Operating	 1.96m/s^2 (0.2 G)(5 ~ 500Hz) 0.98m/s^2 (0.1 G)(5 ~ 500Hz) 19.6m/s^2 (2.0 G) (10 ~ 500Hz X,Y,Z 2h)	Horizontal Only

9.Life

NO	Item	Specification	Condition
9-1	Life 1.Laser (at 25℃) 2.Spindle Motor 3.Feed Motor 4.FPC (Feed Motor) 5.Disc Insertion 6.Eject Button 7.Loading	 2000 h 3000 h current alteration within 30 % from initial 250,000 times current alteration within 30 % from initial 250,000 times 10,000 times 10,000 times 10,000 times	

10. Interface

10-1. Connector

(1) Connector layout

Back side view

(2) Connector pin assignment

Interface description (signal)

Pin	Signal	
S1	Gnd	
S2	A+	Differential signal pair A
S3	A-	
S4	Gnd	
S5	B-	Differential signal pair B
S6	B+	
S7	Gnd	

Interface description (power)

Pin	Signal	
P1	DP	Device Present（1KΩ pull down）
P2	+5V	5V power
P3	+5V	5V power
P4	MD	Manufacturing Diagnostic/ Device Attention *1
P5	Gnd	
P6	Gnd	

*1 : See 23/23 page

DC Characteristics

Parameter	Signal Level		
	min	typ	max
Signal Detection Threshold (mV)	50	100	200
Tx Differential Output Voltage (mV)	400	500	600
Rx Differential Input Voltage (mV)	325	400	600
Tx Pair Differential Impedance (ohm)	85	100	115
Rx Pair Differential Impedance (ohm)	85	100	115

10. Interface (continue)
10-2. SATA command

Packet Commands Supported by Drives

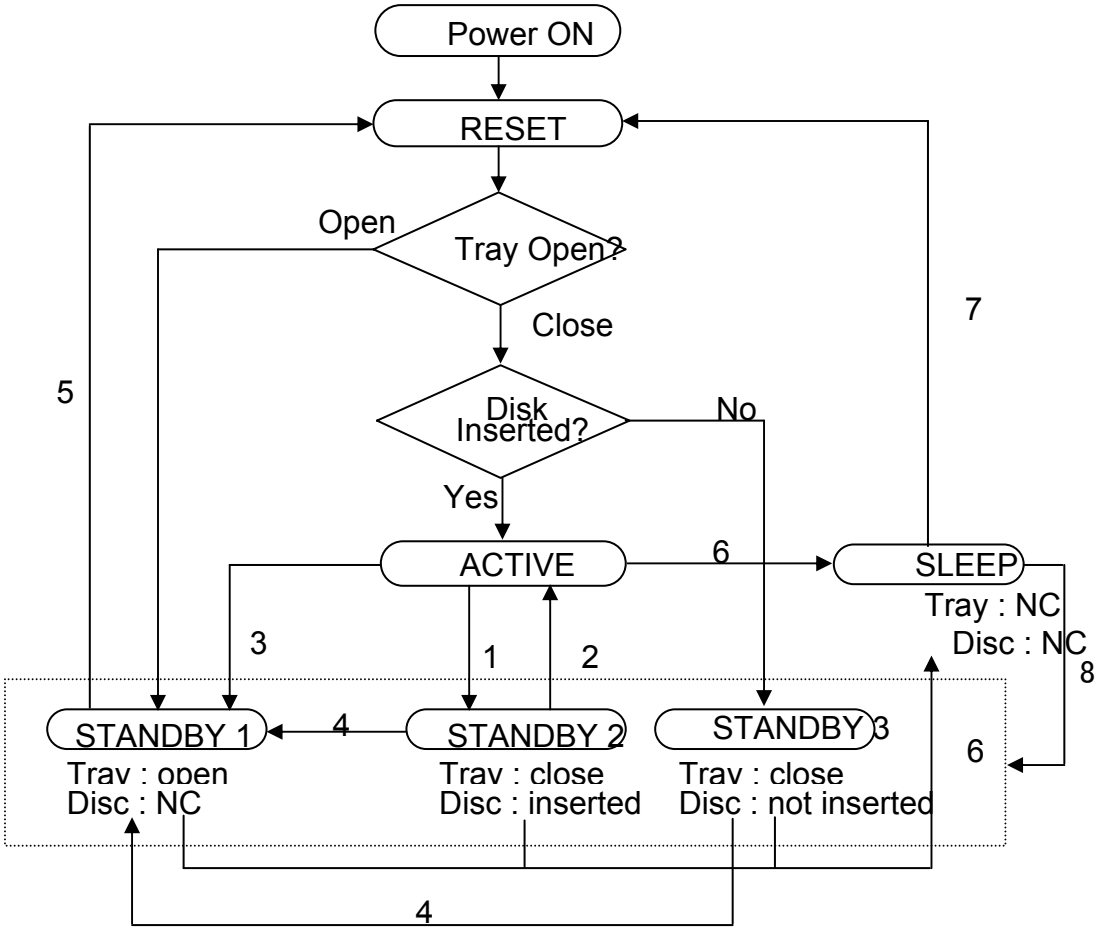
00h	TEST UNIT READY	53h	RESERVE TRACK/RZONE
01h	REZERO UNIT	54h	SEND OPC INFORMATION
03h	REQUEST SENSE	55h	MODE SELECT(10)
04h	FORMAT UNIT	58h	REPAIR RZONE
08h	READ(6)	5Ah	MODE SENSE(10)
0Ah	WRITE(6)	5Bh	CLOSE TRACK/RZONE/SESSION/BORDER
0Bh	SEEK(6)	5Ch	READ BUFFER CAPACITY
12h	INQUIRY	5Dh	SEND CUE SHEET
15h	MODE SELECT(6)	A1h	BLANK
1Ah	MODE SENSE(6)	A3h	SEND KEY
1Bh	START/STOP UNIT	A4h	REPORT KEY
1Eh	PREVENT/ALLOW MEDIUM REMOVAL	A5h	PLAY AUDIO(12)
23h	READ FORMAT CAPACITIES	A7h	SET READ AHEAD
25h	READ CAPACITY	A8h	READ(12)
28h	READ(10)	AAh	WRITE(12)
2Ah	WRITE(10)	ACh	GET PERFORMANCE
2Bh	SEEK(10)	ADh	READ DVD STRUCTURE
2Eh	WRITE AND VERIFY(10)	AEh	WRITE AND VERIFY(12)
2Fh	VERIFY(10)	AFh	VERIFY(12)
35h	FLUSH (SYNCHRONIZE) CACHE	B6h	GET STREAMING
37h	READ DEFECT DATA	B9h	READ CD MSF
3Bh	WRITE BUFFER	BAh	SCAN
3Ch	READ BUFFER	BBh	SET CD SPEED
42h	READ SUB-CHANNEL	BDh	MECHANISM STATUS
43h	READ TOC/PMA/ATIP	BEh	READ CD
44h	READ HEADER	BFh	SEND DVD STRUCTURE
45h	PLAY AUDIO(10)	E8h	READ MICROCODE
46h	GET CONFIGURATION	EAh	WRITE MICROCODE
47h	PLAY AUDIO MSF	F5h	SYNCHRONIZE MICROCODE
4Ah	GET EVENT /STATUS NOTIFICATION	F9h	ALTERNATE SET STREAMING
4Bh	PAUSE/RESUME	FAh	ALTERNATE GET PERFORMANCE
4Eh	STOP PLAY/SCAN	FBh	SEND SPECIAL FUNCTION
51h	READ DISC INFORMATION	FCh	RECEIVE SELF-CONFIGURATION RESULTS
52h	READ TRACK/RZONE INFORMATION		

ATA Commands Supported by Drives

E5h	CHECK POWER MODE	00h	NOP
08h	DEVICE RESET	A0h	PACKET
90h	EXECUTE DEVICE DIAGNOSTIC	EFh	SET FEATURES
A1h	IDENTIFY PACKET DEVICE	E6h	SLEEP
E1h	IDLE IMMEDIATE	E0h	STANDBY IMMEDIATE

11. Power Management

11-1. Status Changes



* Electrical status in a drive is same at STANBY1,2,3

1: At first host executes reset sequence after power is supplied. If a disc is attached and a tray is closed, the drive status becomes ACTIVE Mode. And next If host doesn't execute command for certain time(default 30 sec) a disc stops, and changes STANDBY Mode .In the case of receiving ATAPI command(Standby Immediate),the drive status changes STANDBY Mode soon.

2: In the case of STANDBY Mode at the status that a disc is attached and a tray is closed, if the drive receives command from host, the drive status changes ACTIVE Mode soon.

3: In the case of ACTIVE Mode, a disc is stopped and a tray is opened by ATAPI eject command or pushing eject button at front bezel. And next the drive status change STANDBY Mode again.

11.Power Management (continue)
11-1.Status Changes (continue)

4: In the case of STANDBY Mode, a disc is stopped and a tray is opened by ATAPI eject command or pushing eject button at front bezel. And next the drive status change STANDBY Mode again.

5: In the case of STANDBY Mode at the status that a tray is opened, this drive executes reset sequence by closing a tray. And next If a disc is attached, the drive spin a disc and changes ACTIVE Mode.

6: In the case of ACTIVE or STANDBY mode, this drive goes into Sleep mode immediately after receiving of Sleep Command.
The only way to recover from SLEEP mode is with a software reset or hardware reset.

7: The drive status can recover by hard or soft reset(in the case of SSP disable).
And next the drive status becomes the same sequence with reset status.

8: In the case of SSP enable, the drive goes into STANBY mode immediatelly after receiving of soft reset.

ACTIVE Mode

At first a disc is attached and a tray is closed after power is supplied. And next the drive checks itself. If this check finished perfectly, the drive spin a disc and read TOC.
ACTIVE Mode stands for this status that the drive finish reading TOC.
So laser, spindle motor, and sled motor active.

STANDBY Mode

This mode is a low current consumption mode.
STANDBY Mode stands for this status that only SATA interface active. So laser, spindle motor, and sled motor doesn't active.

SLEEP Mode

This mode is a low current consumption mode.
SLEEP Mode stands for this status that all system(laser, spindle motor, sled motor, SATA interface) doesn't active. The drive can recover by hard/soft reset.

12. Serial ATA Features

12-1. Serial ATA Features Specification

NO	Item	Specification	
12-1	HIPM (Host Initiated link Power Management)	Support	
12-2	DIPM (Device Initiated link Power Management)	Support	Partial Timer : 10ms Slumber Timer 30ms (time after a drive handles the last command)
12-3	AN (Asynchronous Notification)	Support	
12-4	SSP (Software Setting Preservation)	Support	
12-5	SSC (Spread Spectrum Clocking)	Support	

*Both host controller and optical drive need to support HIPM ,DIPM and AN mode to utilize them.

12-2. Link Power Management State

Serial ATA interface power states are controlled by the device and host controller.
The interface power states are defined as below.

PHYRDY

The Phy logic and main PLL are both on and active. The interface is synchronized and capable of receiving and sending data.

PARTIAL

The Phy logic is powered, but is in a reduced power state. Both signal lines on the interface are at a neutral logic state (common mode voltage). The exit latency from this state shall be no longer than 10 us.

SLUMBER

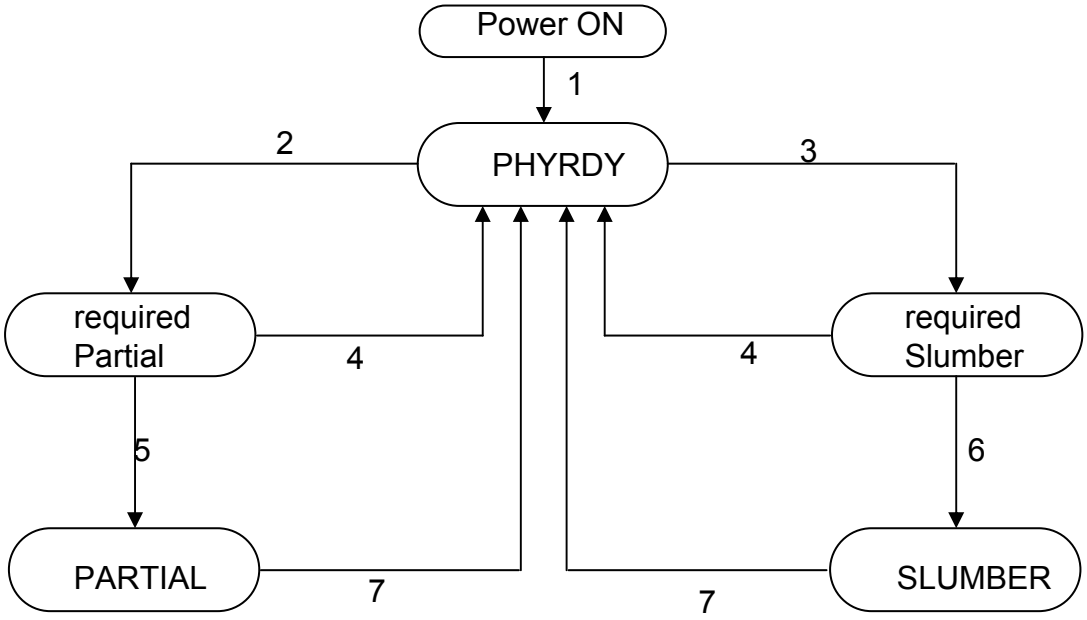
The Phy logic is powered but is in a reduced power state. The common mode level of the AC coupled transmitter is allowed to float (while maintaining zero differential) as long as it remains within the limits cited in Table 27 entry ACcoupled common mode voltage. The exit latency from this state shall be no longer than 10 ms.

12. Serial ATA Features (continue)

12-3.HIPM(Host Initiated link Power Management)

HIPM is a method which controls Serial ATA interface power states by host controller. Logical Unit supports this feature. Host shall issue IDENTIFY PACKET DEVICE before initiate power management transition requests, and check the response data whether HIPM is supported or not.

12-4. HIPM State Changes



1: A power-on or hard reset always returns the Interface Power State to the PHYRDY state from any state.

2: In the case of required Partial, the drive receive PMREQ_P from host.

3: In the case of required Slumber, the drive receive PMREQ_S from host.

4: If the drive issues PMNAK, the status changes into PHYRDY.

5: If the drive issues PMACK, the status changes into PARTIAL.

6: If the drive issues PMACK, the status changes into SLUMBER.

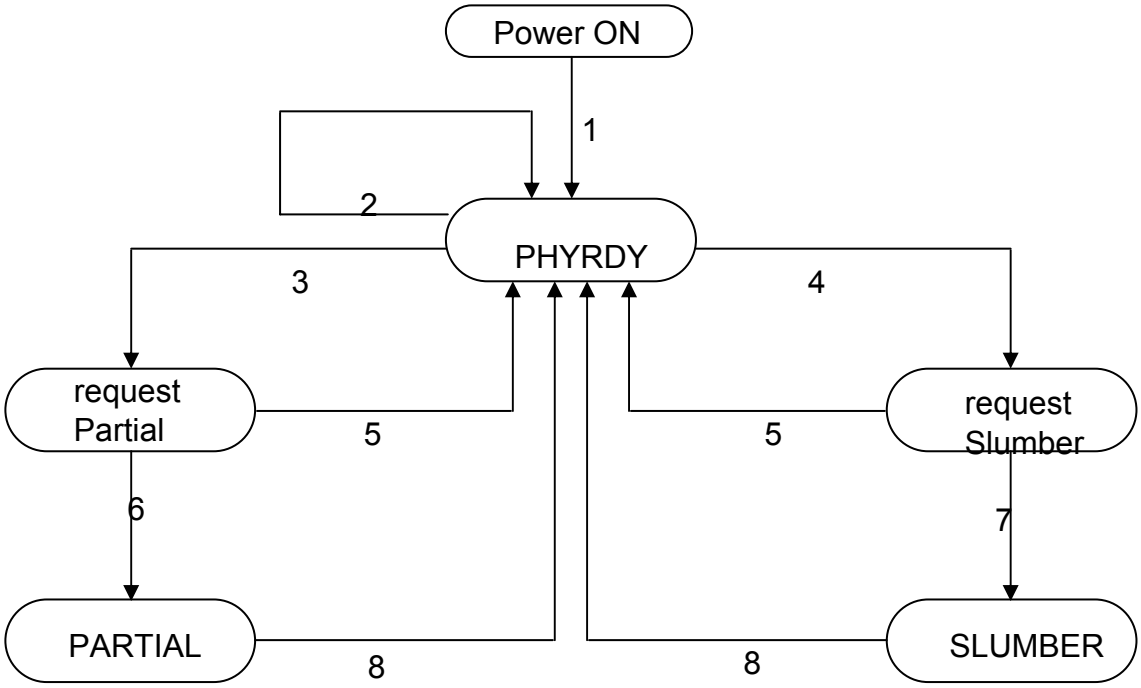
7: If the drive or host issues COMWAKE(or COMRESET/COMINIT), the status changes into PHYRDY.

12. Serial ATA Features (continue)

12-5. DIPM (Device Initiated link Power Management)

DIPM is a method which controls Serial ATA interface power states by the Logical Unit.
The Logical Unit has internal timers, Partial Timer and Slumber Timer , and the timer provide for the Logical Unit to change Interface Power State without direct HOST request. The disabled/enabled of DIPM can be switched by using SET FEATURE command.

12-6. DIPM State Changes



1: A power-on or hard reset always returns the Interface Power State to the PHYRDY state from any state.

2: If the drive received command, the drive keep PHYRDY state and resets the Partial/Slumber Timer.

3: If the drive is IDE interface and the Partial timer reaches zero, the drive issues PMREQ_P.

4: If the drive is IDE interface and the Slumber timer reaches zero, the drive issues PMREQ_S.

5: If the drive received PMNAK from Host, the status changes into PHYRDY.

6: If the drive received PMACK from Host, the status changes into PARTIAL.

7: If the drive received PMACK from Host, the status changes into SLUMBER.

8: If the Partial/Slumber timer reaches zero, the drive issue COMWAKE and changes state to PHYRDY. The drive changes Interface Power State to the Partial state at first , and the Slumber state is started secondly.

12. Serial ATA Features (continue)

12-7. AN (Asynchronous Notification)

Asynchronous notification is a mechanism for a device to send a notification to the host that the device requires attention. A few examples of how this mechanism could be used include indicating media has been inserted in an device.

12-8. SSP (Software Setting Preservation)

When a device is enumerated, software configures the device using SET FEATURES and other commands. These software settings are often preserved across software reset but not necessarily across COMRESET. In Parallel ATA, only commanded hardware resets may occur, thus legacy mode software only reprograms settings that are cleared for the particular type of reset it has issued. In Serial ATA, COMRESET is equivalent to hardware reset and a noncommanded COMRESET may occur if there is an asynchronous loss of signal. Since COMRESET is equivalent to hardware reset, in the case of an asynchronous loss of signal some software settings may be lost without legacy mode software knowledge. In order to avoid losing important software settings without legacy mode driver knowledge, the software settings preservation ensures that the value of important software settings is maintained across a COMRESET. Software settings preservation may be enabled or disabled using SET FEATURES with a subcommand code of 06h .
The feature is enabled by default.

The software settings that is preserved across COMRESET are listed below.
SET FEATURES (Set Transfer Mode): PIO, Multiword, and UDMA transfer mode settings established by the SET FEATURES command with subcommand code of 03h.

12-9. SSC (Spread Spectrum Clocking)

The technique of modulating the operating frequency of a signal slightly to spread its radiated emissions over a range of frequencies. This reduction in the maximum emission for a given frequency helps meet radiated emission requirements.

13. Spindle Control

13-1.Normal disc

Disc Type	Sector Format	CD-ROM/CD-R Closed Session	CD-RW Closed Session	CD-R Open Session	CD-RW Open Session
Audio Only Disc	CD-DA (Data read)	Max 20X CAV	Max 20X CAV	8xCLV	8xCLV
	(Audio play)	Max 12X CAV	Max 12X CAV	-	-
Data Only Disc	Mode1/Mode2Form1 (CD-ROM,PhotoCD)	Max 24X CAV	Max 24X CAV	Max 24xZCLV	Max 16xZCLV
	Mode2Form2 (VideoCD)	Max 20X CAV	Max 20X CAV	8xCLV	8xCLV
Mixed disc (CD-extra)	Mode1/Mode2Form1	Max 24X CAV	Max 24X CAV	Max 24xZCLV	Max 16xZCLV
	Mode2Form2	Max 20X CAV	Max 20X CAV	8xCLV	8xCLV
	CD-DA (Data read)	Max 20X CAV	Max 20X CAV	8xCLV	8xCLV
	(Audio play)	Max 12X CAV	Max 12X CAV	-	-
8cm CD	Data Read	Max 12X CAV	Max 12X CAV	4xCLV	4xCLV

Disc type	Condition	Spindle control		Remark
		12cm media	8cm media	
DVD-ROM Single	Data Read	Max 8X CAV	Max 4X CAV	
DVD-ROM Dual	Data Read	Max 8X CAV	Max 4X CAV	
DVD-Video	Data Read	Max 4X CAV	Max 4X CAV	
DVD-R(4.7G)	Data Read	Max 8X CAV	Max 4X CAV	
DVD-R DL	Data Read	Max 8X CAV	Max 4X CAV	
DVD-RW(Ver1.1/1.2	Data Read	Max 8X CAV	Max 4X CAV	
DVD+R	Data Read	Max 8X CAV	Max 4X CAV	
DVD+R DL	Data Read	Max 8X CAV	Max 4X CAV	
DVD+RW	Data Read	Max 8X CAV	Max 4X CAV	
DVD-RAM	Data Read	Max 3X-5X PCAV	Max 2X ZCLV	

Disc type	Condition	Spindle control		Remark
		12cm media	8cm media	
BD-ROM SL	Data Read	Max 6X CAV	Max 1.6X CLV	2.0X at AV Contents
BD-ROM DL	Data Read	Max 6X CAV	Max 1.6X CLV	2.0X at AV Contents
BD-RE SL	Data Read	Max 6X CAV	Max 1.6X CLV	2.0X at AV Contents
BD-RE DL	Data Read	Max 6X CAV	Max 1.6X CLV	2.0X at AV Contents
BD-RE TL	Data Read	Max 2X CLV	Max 2X CLV	2.0X at AV Contents
BD-R SL	Data Read	Max 6X CAV	Max 1.6X CLV	2.0X at AV Contents
BD-R DL	Data Read	Max 6X CAV	Max 1.6X CLV	2.0X at AV Contents
BD-R TL	Data Read	Max 4X ZCLV	Max 2X CLV	2.0X at AV Contents
BD-R QL	Data Read	Max 4X ZCLV	Max 2X CLV	2.0X at AV Contents

13-2 .Spindle motor control

(1) at playing CD-ROM

Linear Velocity	at 24XCAV	at 12XCAV	Remarks
1.2m/s <1.3m/s	4979 rpm	2490 rpm	at 1.2m/s proportion to linear velocity (1.2~1.3m/s)
1.3m/s	5394 rpm	2697 rpm	more than 1.3m/s

(2) at playing DVD-ROM

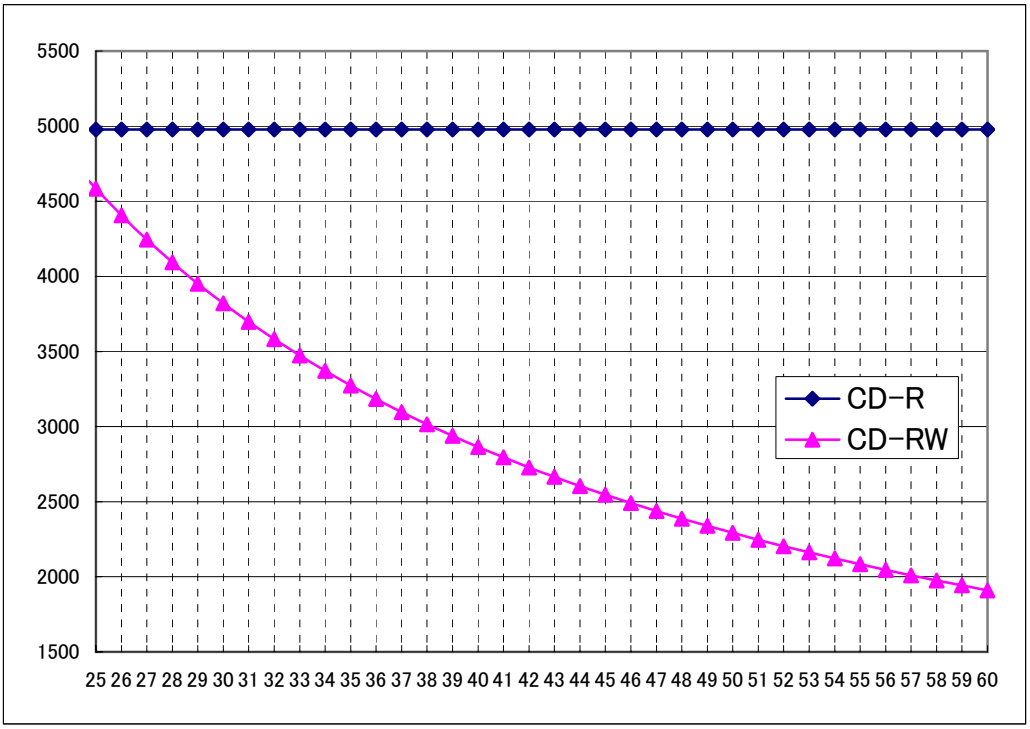
Disc	at 2.5XCAV	at 4XCAV	at 6XCAV	at 8XCAV
Single layer	1480 rpm	2369 rpm	3551 rpm	4735 rpm
Dual layer	1628 rpm	2605 rpm	3907 rpm	

(3) at playing BD-ROM

Disc	at 1.6XCLV	at 2XCLV	at 4XPCAV	at 6XCAV
SL/DL layer	3133 rpm	3916 rpm	3916 rpm	4860 rpm

(4) CD-R Write (Max 24xCAV)
CD-RW Write (10x CLV)

[rpm]



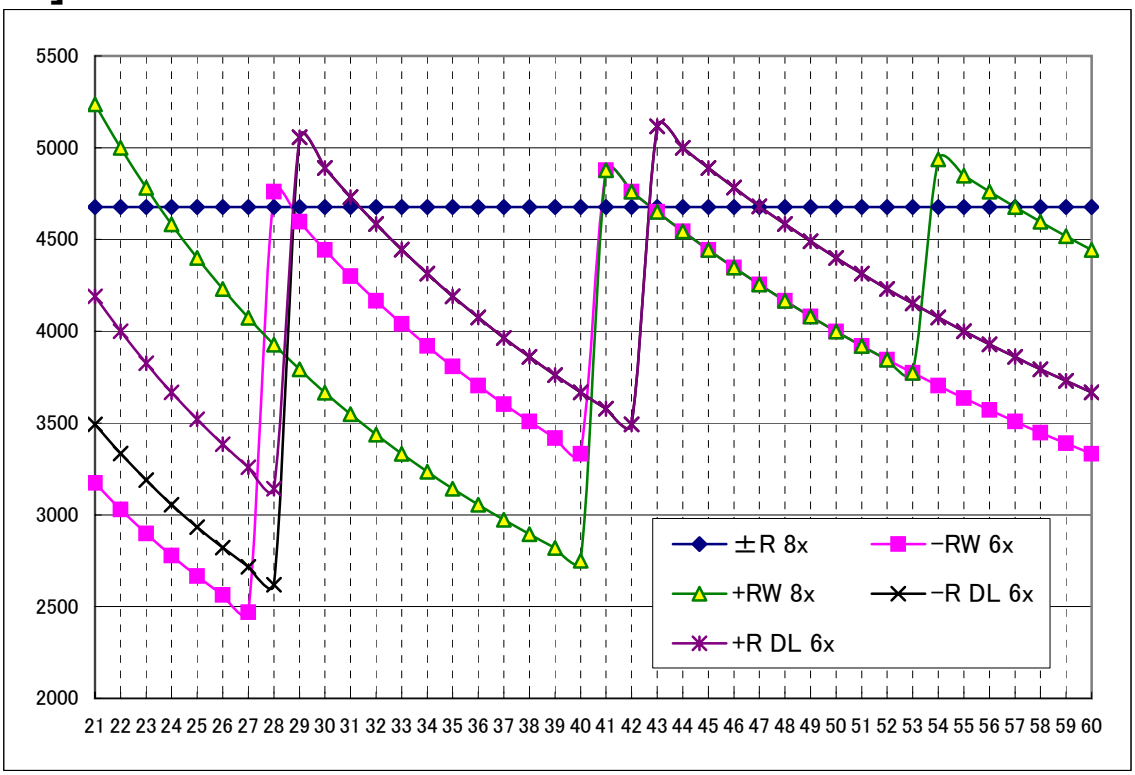
[mm]

Average Write Speed

CD-R	24x CAV	18.85x
CD-RW	10x CLV	10.00x

(5) DVD±R Write（MAX.8x CAV）
DVD-R DL(Max.6x ZoneCLV), DVD+R DL Write（Max.6x Zone CLV）
DVD-RW(Max.6x ZoneCLV), DVD+RW Write（Max.8x Zone CLV）

[rpm]

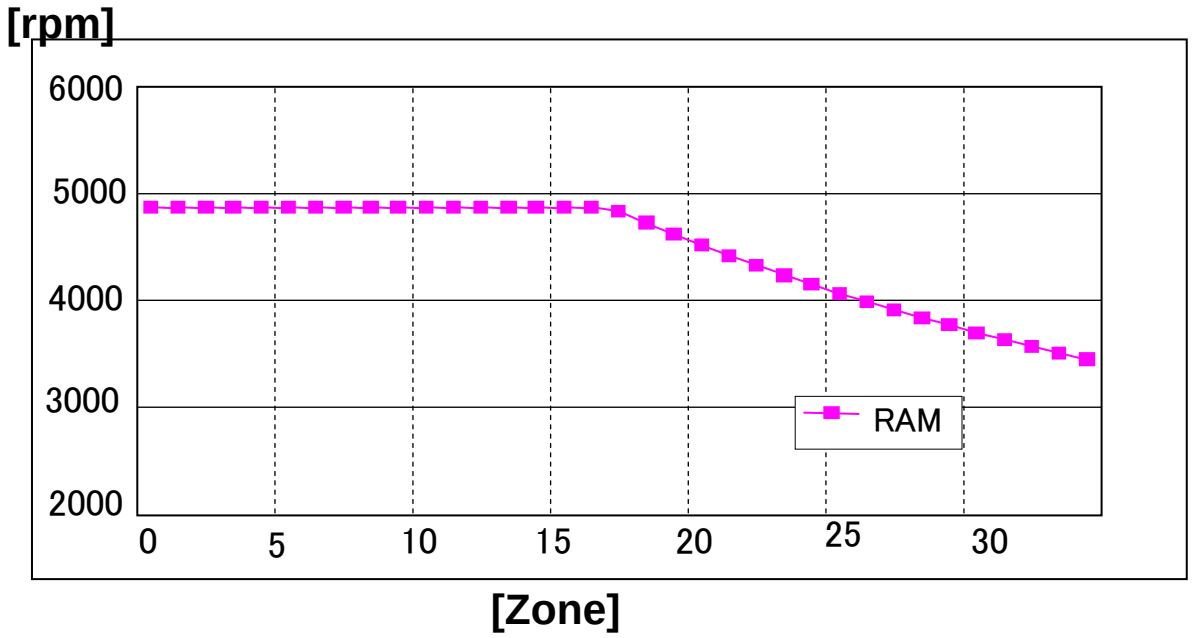


[mm]

Average Write Speed

DVD-R	8x CAV	5.8x
DVD+R	8x CAV	5.8x
DVD-R DL	2x-4x-6x ZCLV	4.48x
DVD+R DL	2.4x-4x-6x ZCLV	4.61x
DVD-RW	2x-4x-6x ZCLV	4.78x
DVD+RW	3.3x-6x-8x ZCLV	4.78x

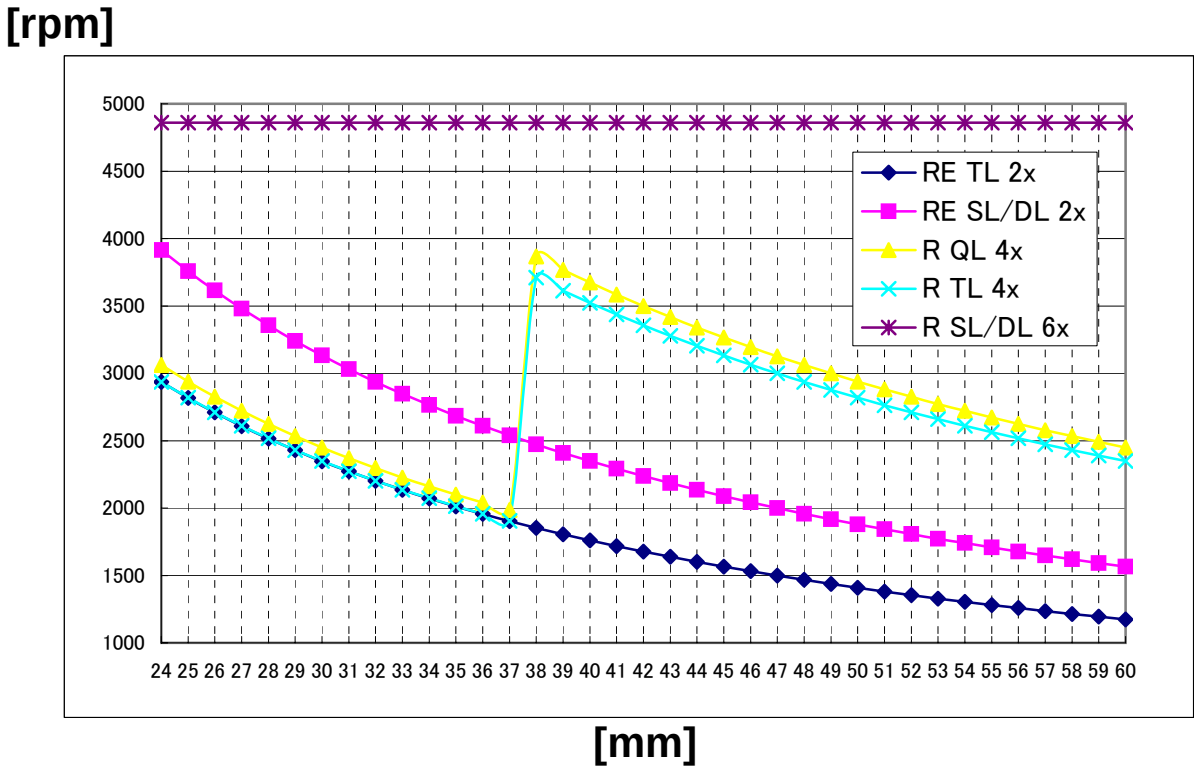
(6) DVD-RAM(Max 3x-5x Partial CAV)



Average Write Speed

DVD-RAM	3x-5x PCAV	4.48x

(7) BD-R SL / DL (6x CAV)
BD-R TL / QL (4x ZCLV)
BD-RE SL / RE DL (2x CLV)
BD-RE TL (2x CLV)



Average Write Speed

BD-R SL/DL	6x CAV	4.5x
BD-R TL/QL	4x ZCLV	3.38x
BD-RE SL/DL/TL	2x CLV	2x

14.Dimension

Refer to the following pages.

15.Notes

a) This pickup is precisely assembled at our specialized assembly line. Please be requested not to disassemble or adjust this pickup.

b) Storage

1) Keep away from hot and high humidity environment.

2) Store them under the condition of not receiving abnormal shock from outside, by having static and dust protecting measures.

3) Keep the dust cover for the protection from dust.

c) Handling

1) Keep away from strong shock such as dropping.

2) Never touch objective lens.

3) Be careful not to be dusted on the objective lens.

4) In case, dust is on the objective lens, sweep away the dust with clean air.

5) Worker involved should be secured with "ground".

6) Workshop and tool must be grounded securely.

7) Never be so close with magnetic material since actuator portion holds strong magnet circuit. (Iron dust, screws, iron-pins in driving area cause problems.)

8) Don't push the cover of the Drive.

9) Fragile. Handle with care.

d) Installation of a drive

Torque for tightening screws must be equal to or less than 0.2Nm(2kgf-cm),when a drive is fixed with.

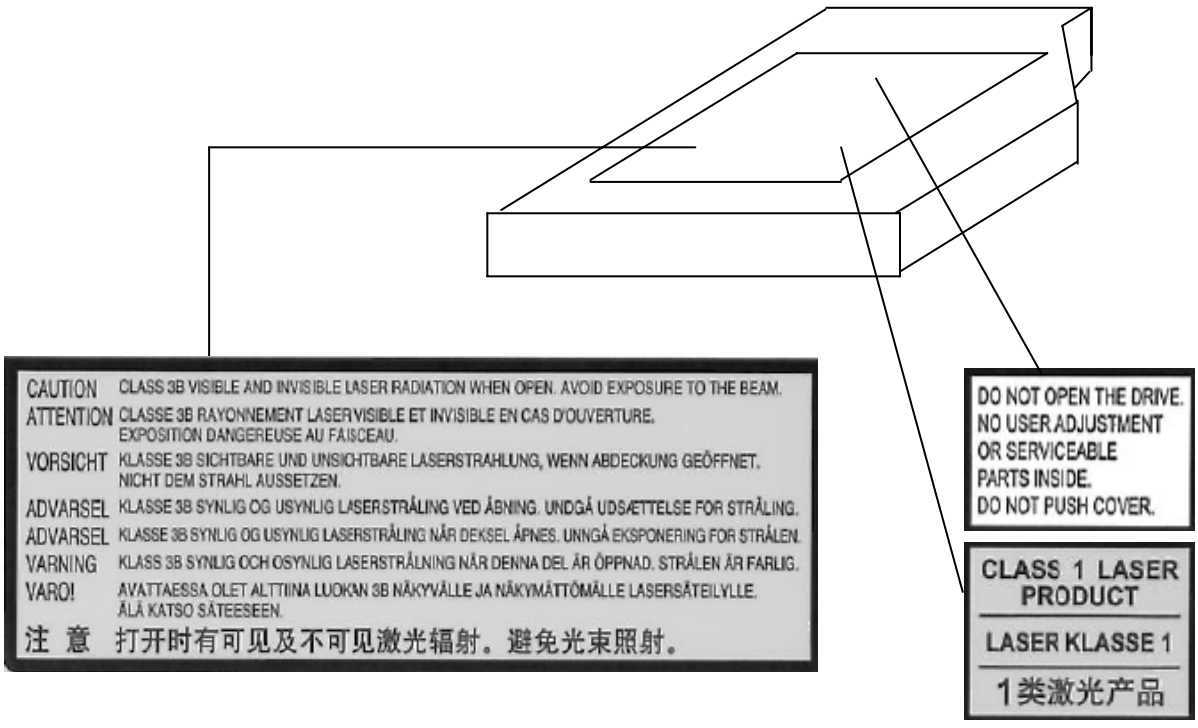
16. Information for Laser / UJ260 series

Information For the User

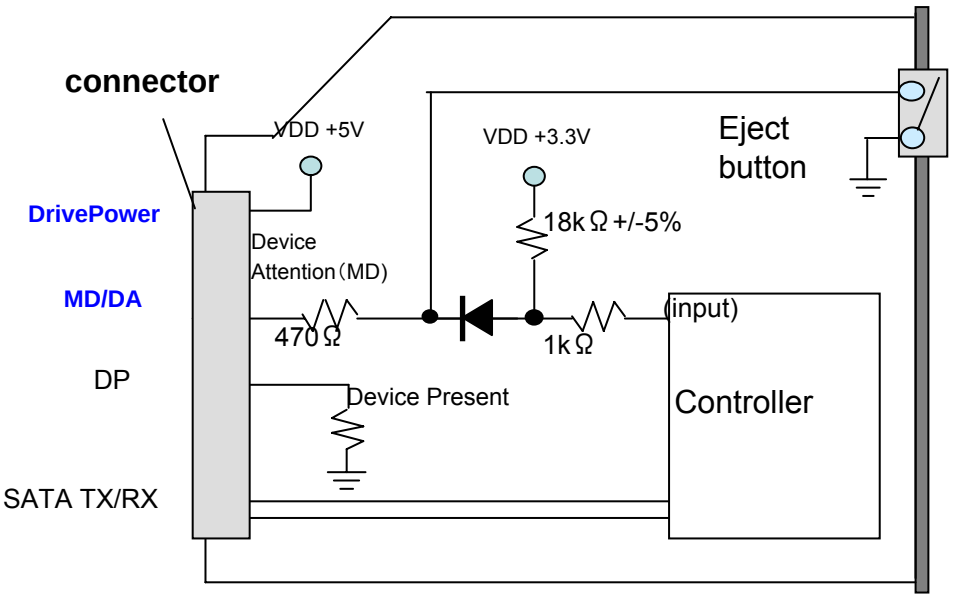
This product utilizes a laser.
Use of control, adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.
Do not open covers and do not repair yourself. Refer servicing to qualified personnel.

Laser properties of the Drive		
Laser Class	Class 1 (HHS and IEC 60825-1)	
Wavelength	for CD	783 nm
	for DVD	661.5 nm
	for Blu-ray	405nm

Location of Labeling



17. Drive Circuit (MD/DA)

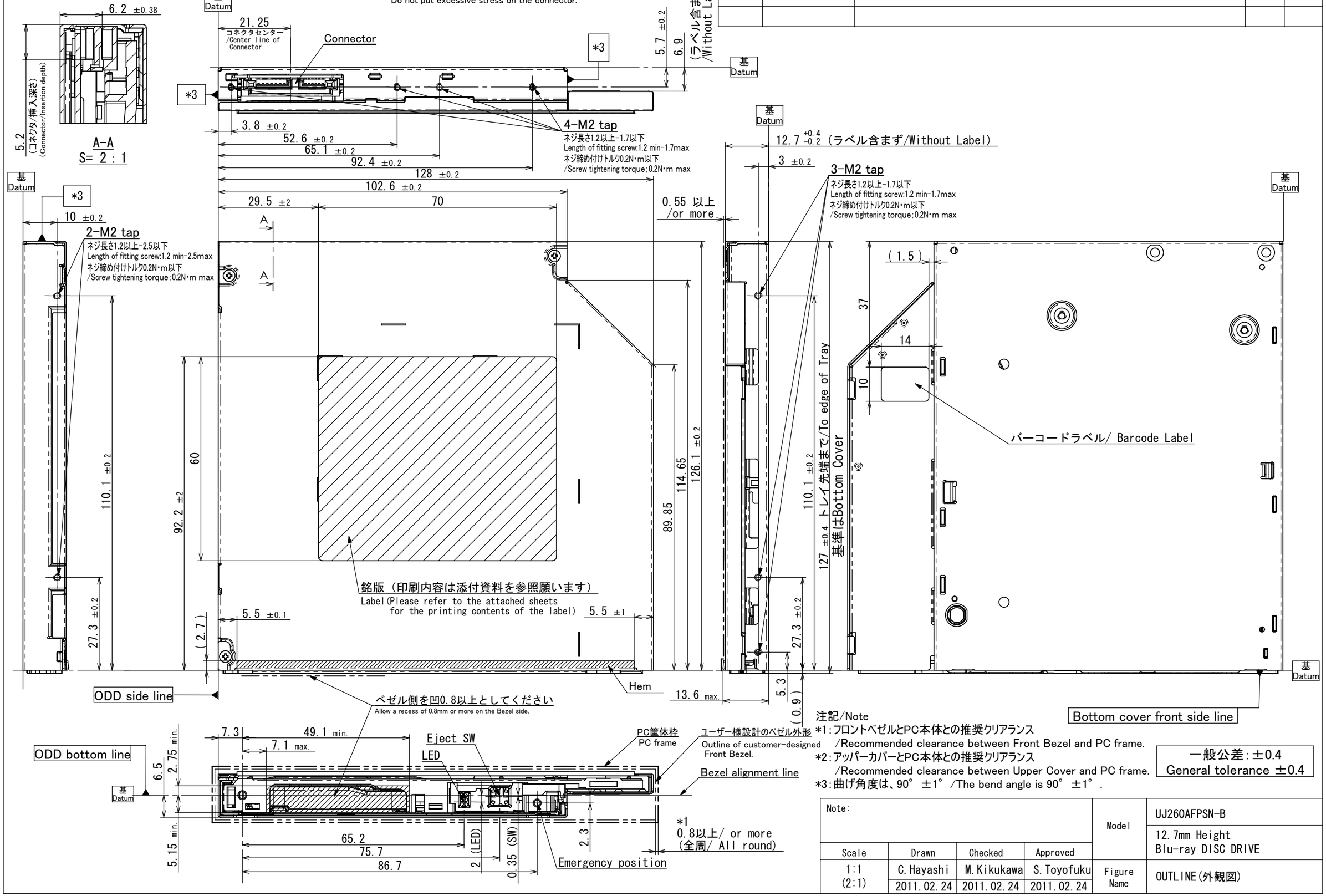


When you use the function of DA, please contact us for discussion.

1.外観図/Outline

注)コネクタに負荷のかからない取付構成としてください。
Caution:The connector is attached to the PCB only by solder.
Do not put excessive stress on the connector.

sym	Date	Revision	Signed	Checked



注記/Note
*1:フロントベゼルとPC本体との推奨クリアランス
/Recommended clearance between Front Bezel and PC frame.
*2:アッパーカバーとPC本体との推奨クリアランス
/Recommended clearance between Upper Cover and PC frame.
*3:曲げ角度は、90° ±1° /The bend angle is 90° ±1° .

一般公差:±0.4
General tolerance ±0.4

Note:				Model	UJ260AFPSN-B
					12.7mm Height Blu-ray DISC DRIVE
Scale	Drawn	Checked	Approved		
1:1 (2:1)	C.Hayashi	M.Kikukawa	S.Toyofuku	Figure Name	OUTLINE(外観図)
	2011.02.24	2011.02.24	2011.02.24		

Panasonic System Networks Co.,Ltd.

Unit:mm