

Issued Date	Jul, 13, 2015	<b>GTC0N. ATWA10B</b>		<b>1/26</b>
Revised Date	Oct, 05, 2016		1.01	

**SPECIFICATIONS**  
OF  
Slim DVD Super Multi Drive  
**Model GTC0N ATWA10B**  
  
**For Afaster**

# Hitachi-LG Data Storage Inc.

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## Revision History

No.	Date	Brief description	Note
1	2015.07.13	Regular version	1.00
2	2016.10.05	Delete CD/DVD+ logo on main label on p24	1.01

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## 1. Features

### 1.1 General

- (1) 12.7mm Height Internal Slim Super Multi Drive
- (2) CD-R/RW, DVD-R/RW/RAM/ +R/+RW +/-R DL read and write compatible, CD Family and DVD-ROM read compatible
- (3) Enhanced IDE (ATAPI) interface : SATA Interface
- (4) Buffer memory 0.5MB
- (5) Buffer Under-run prevention function embedded
- (6) Walking OPC (Optimum Power Calibration) circuit
- (7) Drawer Type manual Load / Electrical Release
- (8) Supports Power saving mode and Sleep mode
- (9) Vertical and Horizontal installable
- (10) Supports Zero Power Function
- (11) Comply with PF(Phthalate Free)

### 1.2 Supported disc formats

- (1) Reads data in each DVD-ROM, DVD-R (Ver.1.0, Ver. 2.0 for Authoring)
- (2) Reads and writes data in each DVD-R (Ver. 2.1 for General), DVD-R DL (Dual Layer), DVD-RW, DVD-RAM (Ver.2.2), DVD+R, DVD+R DL (Double Layer), and +RW
- (3) Reads data in each CD-ROM, CD-ROM XA, CD-I, Video CD, CD-Extra and CD-Text
- (4) Reads data in Photo CD (Single and Multi session )
- (5) Reads standard CD-DA
- (6) Support to read Super Audio CD (Compatible layer in Hybrid type)
- (7) Reads and writes CD-R discs conforming to "Orange Book Part 2"
- (8) Reads and writes CD-RW discs conforming to "Orange Book Part 3"
- (9) CPRM (DVD-R/RW/RAM) supported
- (10) Reads and writes data in DVD+R(M-DISC)

### 1.3 Supported write method

- (1) DVD-R: Disc at Once and Incremental Recording
- (2) DVD-R DL: Disc at Once , Incremental Recording and Layer Jump Recording
- (3) DVD-RW: Disc at Once, Incremental Recording and Restricted Overwrite
- (4) DVD-RAM: Random Write
- (5) DVD+R: Sequential Recording
- (6) DVD+R DL Sequential Recording
- (7) DVD+RW: Random Write
- (8) CD-R/RW: Disc at Once, Session at Once, Track at Once and Packet Write

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## 1.4 Performance

- (1) Average access time: DVD-ROM 160 ms  
(Random access) CD-ROM 140 ms
- (2) Write speed:
- |                |   |
|----------------|---|
| DVD-R          | 4x PCAV, 8x CAV   |
| DVD-R DL       | 2x CLV, 4x PCAV, 6x PCAV  |
| DVD-RW         | 2x CLV, 4x, 6x ZCLV   |
| DVD-RAM        | 2x, 3x CLV, 5x PCAV(Ver.2.2)<br>(12x Media: Not support)                        |
| DVD+R          | 4x PCAV, 8x CAV   |
| DVD+R (M-DISC) | 4x PCAV   |
| DVD+R DL       | 2.4x CLV, 4x PCAV, 6x PCAV  |
| DVD+RW         | 2.4x, 3.3x CLV, 4x ZCLV, 6x ZCLV, 8x ZCLV                                       |
| CD-R           | 10x CLV, 16x ZCLV, 24x CAV  |
| CD-RW          | 4x, 10x CLV, 16x ZCLV, 24x ZCLV<br>(High Speed: 10x CLV, Ultra Speed: 24x ZCLV) |
- (3) Read speed:
- |                   |                             |
|-------------------|-----------------------------|
| DVD-R/RW/ROM      | 8x/8x/8x max.               |
| DVD-R DL          | 8x max.                     |
| DVD-RAM (Ver.2.2) | 5x max.                     |
| DVD-Video         | 4x max. (Single/Dual layer) |
| DVD+R/+RW         | 8x/8x max.                  |
| DVD+R DL          | 8x max.                     |
| CD-R/RW/ROM       | 24x/24x/24x max.            |
| CD-DA (DAE)       | 24x max.                    |
- (4) Sustained Transfer rate:
- |         |                          |
|---------|--------------------------|
| DVD-ROM | 11.08 Mbytes/s (8x) max. |
| CD-ROM  | 3,600 kB/s (24x) max.    |
- (5) Legacy data Transfer mode :
- ATA PIO Mode 0-4
  - ATA Multi Word DMA Modes 0-2
  - ATA Ultra DMA Mode 0-6
- (6) Support CD-Text read/write

## 1.5 Audio

- (1) 16 bit digital data output through ATA interface

### \*Definition

Transfer Rate: 1x (DVD) = 1.385 Mbytes/s, Mbytes/s =  $10^6$  bytes/s,  
1x (CD) = 150 kB/s kB/s =  $2^{10}$  bytes/s

Capacity: MB =  $2^{20}$  bytes, kB =  $2^{10}$  bytes

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## 2. General description

### 2.1 Applicable disc formats

<DVD>	DVD-ROM: 4.7GB (Single Layer) 8.5GB (Dual Layer)
	DVD-R: 3.95GB (Ver. 1.0: read only) 4.7GB (Ver. 2.0 for Authoring: read only) 4.7GB (Ver. 2.1 for General: read & write) (DL) 8.5GB (Ver. 3.0)
	DVD-RW: 4.7GB (Ver. 1.2/ Rev 1.0, 2.0, 3.0)
	DVD-RAM: 2.6GB/side (Ver.1.0) -> Not Support 4.7GB/side (Ver. 2.2)
	DVD+R: 4.7GB (Ver. 1.3) (DL) 8.5GB (Ver. 1.1)
	DVD+RW: 4.7GB (Ver. 1.3)
	DVD-RW DL : Not support
<CD>	CD-ROM Mode-1 data disc CD-ROM Mode-2 data disc CD-ROM XA, CD-I, Photo-CD Multi-Session, Video CD CD-Audio Disc Mixed mode CD-ROM disc (data and audio) CD-Extra CD-Text CD-R (Conforming to "Orange Book Part 2": read & write) CD-RW (Conforming to "Orange Book Part 3": read & write)

### 2.2 Writing method

(1) DVD-R/RW	Disc at Once (DAO) Incremental Recording Restricted Overwrite (DVD-RW only)
(2) DVD-R DL	Disc at Once (DAO) Incremental Recording Layer Jump Recording
(3) DVD-RAM/+RW	Random Write
(4) DVD+R	Sequential Recording
(5) DVD+R DL	Sequential Recording
(6) CD-R/RW	Disc at Once (DAO) Session at Once (SAO) Track at Once (TAO) Packet Writing

### 2.3 Disc diameter

120 mm  
80 mm

### 2.4 Data capacity

User data / Block

DVD-ROM/R/RW/RAM /+R/+RW  
2,048 bytes/block  
CD (Yellow Book)  
2,048 bytes/block (Mode1 & Mode2 Form1)  
2,336 bytes/block (Mode2)  
2,328 bytes/block (Mode2 Form2)  
2,352 bytes/block (CD-DA)



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## 3. Drive performance

### 3.1 Host interface

T13 ATA/ATAPI-8  
 MMC-6, SFF-8090i v8  
 Serial ATA Revision 3.0 (RSG: complied UTD 1.4 Gen1)

### 3.2 Write Speed

Media (Media Speed)	Writing Speed	Transfer rate (DVD: Mbytes/s, CD: kB/s)
DVD-R (1-2x)	2x CLV	2.77 Mbytes/s
-R (1-4x)	3.3x-4x P-CAV	4.58-5.54
-R (1-8x)	3.3x-4x P-CAV, 3.3-8x CAV	4.58-5.54, 4.58-11.08
-R (1-16x)	3.3x-4x P-CAV, 3.3-8x CAV	4.58-5.54, 4.58-11.08
-R (8cm)	2x CLV	2.77
DVD-R DL (4x)	2x CLV, 3.3x-4x P-CAV	2.77, 4.58+5.54
DVD-R DL (8x)	2x CLV, 3.3x-4x P-CAV, 3.3-6x P-CAV	2.77, 4.58+5.54, 4.58-8.31
DVD-RW (1-2x)	2x CLV	2.77
-RW (2-4x)	2x CLV, 2+4x ZCLV	2.77, 2.77+5.54
-RW (2-6x)	2x CLV, 2+4x, 2+4+6x ZCLV	2.77, 2.77+5.54, 2.77+5.54+8.31
-RW (8cm)	2x CLV	2.77
DVD-RAM (2x)	2x CLV	2.77 (w/o Verify)
-RAM (2-3x)	3x CLV	4.16 (w/o Verify)
-RAM (2-5x)	3-5x P-CAV	4.16-6.93 (w/o Verify)
-RAM (over 12x)	Not supported	
-RAM (8cm)	2x CLV	2.77 (w/o Verify)
DVD+R (2.4x)	2.4x CLV	3.32
+R (2.4-4x)	3.3x-4x P-CAV	4.58+5.54
+R (2.4-8x)	3.3x-4x P-CAV, 3.3-8x CAV	4.58+5.54, 4.58-11.08
+R (2.4-16x)	3.3x-4x P-CAV, 3.3-8x CAV	4.58+5.54, 4.58-11.08
DVD+R DL (2.4x)	2.4x CLV	3.32
DVD+R DL(8x)	2.4x CLV, 3.3x-4x P-CAV 3.3-6x P-CAV	3.32, 4.58+5.54 4.58-8.31
DVD+RW (2.4x)	2.4x CLV	3.32
+RW (2.4-4x)	2.4x CLV, 2.4+4x ZCLV	3.32, 3.32+5.54
+RW (3.3-8x)	3.3x CLV, 3.3+6+8x ZCLV	4.58, 4.58+8.31+11.08
CD-R	10x CLV, 10+16x ZCLV 24x CAV	1,500, 1,500+2,400 3,600
CD-RW (MS)	4x CLV	600
-RW(HS)	10x CLV	1,500
-RW (US)	10 CLV, 10+16x ZCLV 10+16+24x ZCLV	1,500, 1,500+2,400 1,500+2,400+3,600

\* Rotational speed (CLV, ZCLV)

DVD-R/RW/ROM,+R/RW	1x: Approx. 1,390 (Inside) - 580 r/min (Outside)
DVD-RAM Ver.2.2	2x: Approx. 3,250 (Inside) - 1,380 r/min (Outside)
CD-R/RW/ROM	1x: Approx. 500 (Inside) - 210 r/min (Outside)

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## 3.3 Read Speed

Media (Media Speed)	Read Speed	Transfer rate (DVD: Mbytes/s, CD: kB/s)	Rotational speed (Approx. r/min)
DVD-ROM (Single Layer)	3.3 - 8x CAV	4.58 - 11.08 Mbytes/s	4,710 r/min
(Dual Layer)	3.3 - 8x CAV	4.58 - 11.08	5,180
DVD-Video*1	1.7 - 4x CAV	2.29 - 5.54	2,600
DVD-R (3.95GB/Data)	3.3 - 8x CAV	4.58 - 11.08	5,180
(3.95GB/Video Format)	1.7 - 4x CAV	2.29 - 5.54	2,600
(4.7GB/Data)	3.3 - 8x CAV	4.58 - 11.08	4,710
(4.7GB/VF)	1.7 - 4x CAV	2.29 - 5.54	2,600
DVD-R DL	3.3 - 8x CAV	5.58 - 11.08	5,180
DVD-RW (Data)	3.3 - 8x CAV	4.58 - 11.08	4,710
(VF)	1.7 - 4x CAV	2.29 - 5.54	2,600
(Video & Data)	1.7 - 4x CAV	2.29 - 5.54	2,600
DVD-RAM *2(Ver. 2.2)	3 - 5x PCAV	4.16 - 6.93	4,880 - 3,450
DVD+R	3.3 - 8x CAV	4.58 - 11.08	4,710
DVD+R DL	3.3 - 8x CAV	4.58 - 11.08	5,180
DVD+RW	3.3 - 8x CAV	4.58 - 11.08	4,710
CD-ROM/PhotoCD	10 - 24x CAV	1,500 - 3,600 kB/s	4,860 - 5,200 r/min
CD-R/RW	10 - 24x CAV	1,500 - 3,600	4,860 - 5,200
CD-DA(DAE)	10 - 24x CAV	1,500 - 3,000	4,860 - 5,200
CD-DA (Audio Play)	4.3 - 10x CAV	650 - 1,500	2,020 - 2,360
CD-I/VideoCD	4.3 - 10x CAV	650 - 1,500	2,020 - 2,360

\*1) DVD-Video: CSS, No CSS, Single Layer, Dual Layer are same as above.

\*2) DVD-RAM: Data, Video Format are same as above.

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**3.4 Data transfer rate**

SATA Gen.1 1.5 G bps (150MB/s)

**3.5 Access time (Random access)**

DVD-ROM	160 ms typ.* (Note 1)
DVD-RAM (Ver.2.2)	260 ms typ.
CD-ROM	140 ms typ. (Note 1)

**Note :**

1) Average access time is the typical value of more than 50 times including latency and error correction time.

Test Disc: DVD: ALMEDIO TDR-820A  
 CD: ALMEDIO TCDR-701

*\*) Typical value defines a measured value in normal temperature (20 °C) and horizontal position.*

**3.6 Data error rate** (Measured with 5 retries maximum)

DVD-R/RW/ROM/RAM	$<10^{-12}$
DVD+R/+RW	$<10^{-12}$
CD-R/RW/ROM	$<10^{-12}$ (Mode-1)
	$<10^{-9}$ (Mode-2)

Condition: It is assumed that the worst case raw error rate of the disc is  $10^{-3}$

**3.7 Spin up time** without Multi-session

DVD-ROM (SL)	11 s typ.	(Time to drive ready mode from power on)
	4 s typ.	(Time to drive ready mode from sleep)
CD-ROM	11 s typ.	(Time to drive ready mode from power on)
	4 s typ.	(Time to drive ready mode from sleep)

**3.8 Data buffer capacity** 0.5 MB

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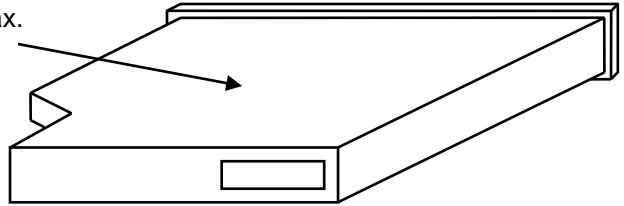
## 4. Environmental Conditions

### 4.1 Ambient Temperature

Operating	Read	5 to 50 °C
	Write	5 to 45 °C
Storage/Transportation		-30 to 60 °C

### 4.2 Approval Temperature Rise

Center of Top Cover 56 °C max.



4.3 Temperature Gradient 10 °C/h

### 4.4 Relative Humidity

Operating	Read	15 % to 85 % (Non-Condensing)
	Write	15 % to 80 % (Depend on the Temperature)
Storage/Transportation		10 % to 90 % (Non-Condensing)

4.5 Dew point temperature restrictions Less than 29 °C

### 4.6 Altitude

Operating	0 to 3000 m
Non-operating	0 to 12000 m

### 4.7 Vibration

(1) Operating

Read:	1.96 m/s <sup>2</sup> (0.2 G) No unrecoverable error 5 to 300 Hz sine wave sweep, 3 oct./min at Each of 3 directions <sup>1)</sup> ,
Write:	0.98 m/s <sup>2</sup> (0.1 G) No recording stop 5 to 300 Hz sine wave sweep, 6 oct./min at Each of 3 directions <sup>1)</sup>

(2) Non-Operating: 9.8 m/s<sup>2</sup> (1.0 G) No physical and electrical damage. (No disc loaded)  
5 to 300 Hz sine wave sweep, 1 oct./min at Each of 3 directions<sup>1)</sup>

(3)Transportation: 8.04 m/s<sup>2</sup> (0.82 G) No damage must results. (Packed unit)  
5 to 50 Hz random vibration for 20 min at Z-axis direction.

\* <sup>1)</sup> 3direction : X (left and right), Y (back and front), Z (top and bottom) axis

### 4.8 Shock

(1) Operating

Read:	49 m/s <sup>2</sup> (5 G) No unrecoverable error (“Retries” are allowed.) 11 ms Half sine wave(5 time shocks, 5 s between shocks. ) at Each of 3 directions <sup>1)</sup>
write:	1.96 m/s <sup>2</sup> (0.2 G) No recording stop. 11 ms Half sine wave, at Each of 3 directions <sup>1)</sup> (5 time shocks, 5 s between shocks. )

(2) Non-Operating: 980 m/s<sup>2</sup> (100 G) No damage after shock. (No disc loaded)  
2 ms Half sine wave at Each of 3 directions<sup>1)</sup>

\* <sup>1)</sup> 3direction : X (left and right), Y (back and front), Z (top and bottom) axis

### 4.9 Drop Impact

Less than 60 cm

Note: Bulk package, 1 Corner, 3 Edges, 6 Faces.

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## 5. Quality and Reliability

### 5.1 MTBF

Assumption:	150,000 Power On hours (POH)
-POH per year	Used in a normal office environment at room temperature.
-ON/OFF cycles per year	3,000
-Operating duty cycle	480
	10 % of Power on time (Seek: 10 % of operating time)

### 5.2 Tray Cycle Test

10,000 times tray open/close cycle test

### 5.3 Actuator Mechanism

1,000,000 full stroke seek

### 5.4 MTTR (Mean Time to Repair)

0.5 h

### 5.5 Component Life

5 years or 2,000h of Laser radiating time

Assumption: Used in a normal office environment

## 6. Electro Static Discharge Susceptibility (ESD)

Up to 6 kV(contact)	No user detectable data error
Up to 8 kV(contact)	No catastrophic failure or damage
Up to 10kV (Air)	No user detectable data error
Up to 15kV (Air)	No catastrophic failure or damage

*\* Test Conditions : C = 150pF, R = 330 ohms, 20 times discharge except Optical Pick-up block and Connector*

## 7. Power Requirements

### 7.1 Source Voltage

+5V±5% Ripple Less than 100 mVp-p

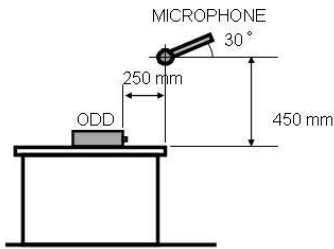
### 7.2 Current

Standby	50 mA typ.	(No power management)
DIPM on (Partial) *1	60 mA typ.	
DIPM on (Slumber) *1	20 mA typ.	
Continuous Read	750 mA typ.	(CD-ROM 24x max. CAV)
	750 mA typ.	(DVD-ROM 8x max. CAV)
Continuous Write	800 mA typ.	(CD-R 24x CAV)
	750 mA typ.	(DVD+R 8x CAV)
	850 mA typ.	(DVD+/-R DL 6x ZCLV)
Spin UP(Spindle motor start up)	1.5 A max. *3	
Maximum Current	1.5 A *3	

\*1) If Zero Power Function is supported, 0 mA  
\*2) typ : Measured duration 10sec rms value.  
\*3) max : Excluded spike current <1ms duration

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**8. Acoustic Noise**



Less than 50 dBA at 0.25 m away from Bezel and 0.45 m height away (ISO7779 Seated Operator Position)

- Note:
1. Disc: Less than Unbalance 0.25 g·cm
  2. Installation: Horizontal
  3. Ambient Temperature: Normal Temperature
  4. Except loading and unloading
  5. bare drive condition

**9. Dimensions**

W x H x D      128 x 12.7 x 127 mm      ( Refer to Section 13.)

**10. Mass**

Max. 160 g (without bezel)

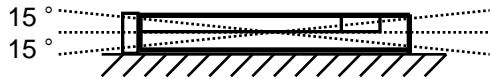
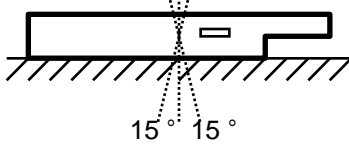
**11. Mechanicals**

**11.1 Disc Loading**

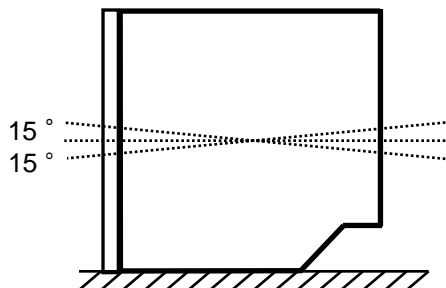
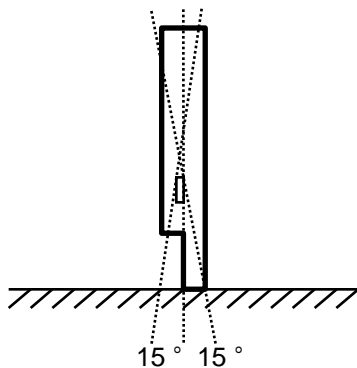
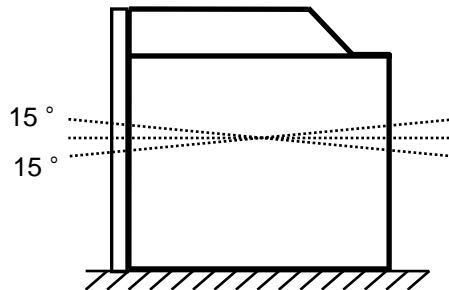
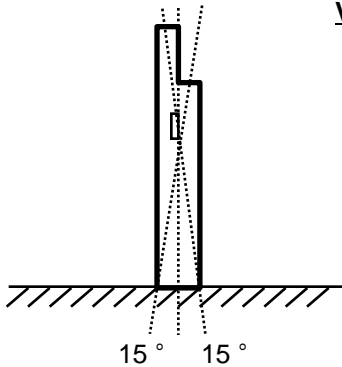
Drawer type manual load / Electrical release

**11.2 Mounting Requirements**

Horizontal



Vertical



-Note-

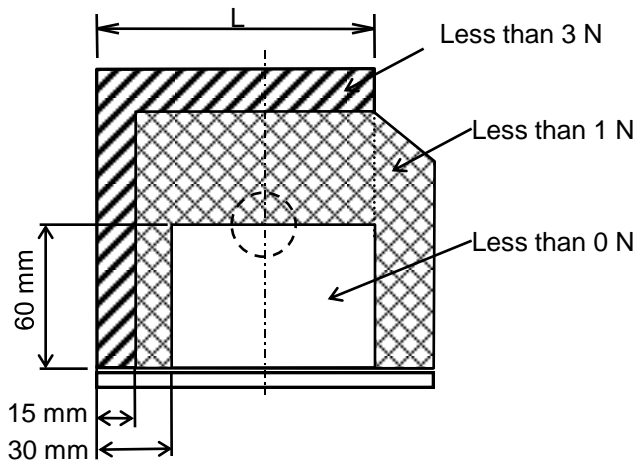
Operation with postures other than the above drawings is not guaranteed.

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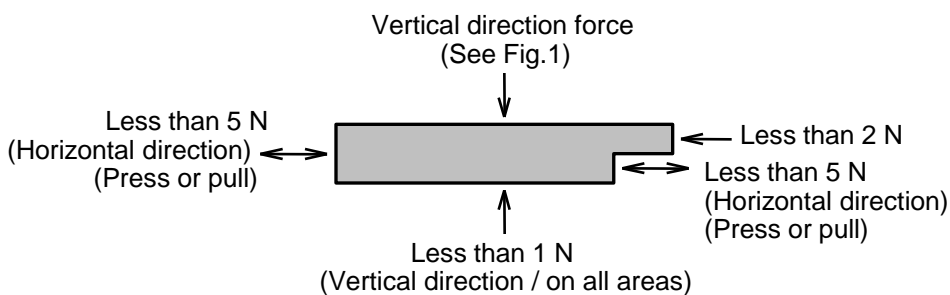
**11.3 Installation conditions**

If the drive is not installed under the following conditions, it may not operate properly or cause damage to the drive.

- (1) When mounting the equipment, use tapping screw holes located on the left and right both sides of the equipment.  
 When using screws to fix the connector from the host computer to the equipment, use tapping screw holes located on the back side of the equipment.
  - Recommended screw tightening torque : 0.2 N·m
  - Required screw depth : Max.1.5 mm or Max.2.5 mm or Max.3.0mm  
 (See Chapter 13 Mechanical Dimensions for detail.)
- (2) Do not apply an excessive force (press, pull or twist) to avoid distorting the equipment.
  - Recommended width of the mounting frame surface on left and right  
 Dimension L : 102.6 +/- 0.2 mm (See Fig.1)
  - Recommended value for Top and bottom case : See Fig.1 and Fig.2 for detail.
  - After mounting the connector, do not apply excessive force the connector of the equipment in horizontal and/or vertical direction.
  - Tighten screws evenly.
  - Mounting frame surface contacted with the equipment must be flat.
- (3) Allow enough space as much as possible in all directions around the equipment so the equipment does not apply any vibration, mechanical shock, etc. from peripheral instruments.
  - For the maximum dimension of the equipment thickness  
 Recommended clearance : more than 0.5 mm.
  - Recommended clearance around the front bezel : more than 1 mm .



**Fig.1 top view**

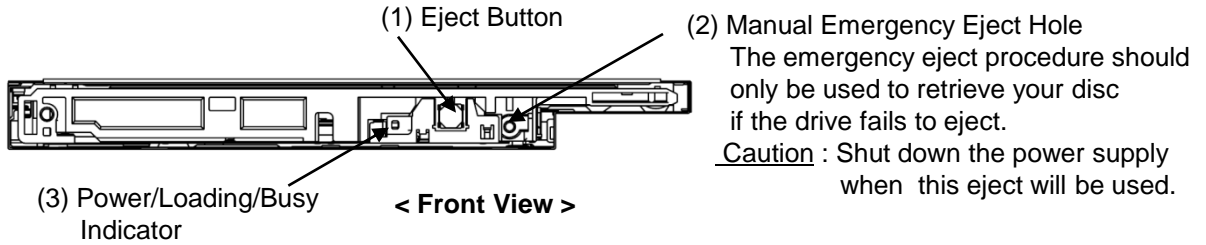


**Fig.2 front view**

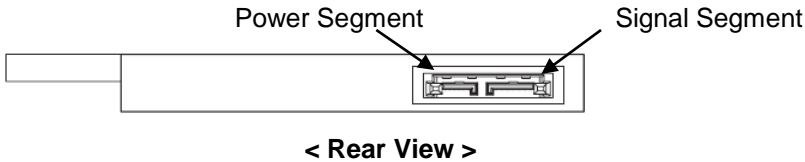
Issued Date	Jul, 13, 2015	<b>GTC0N. ATWA10B</b>	1.01	<b>16/26</b>
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## 12. Controls and Functions

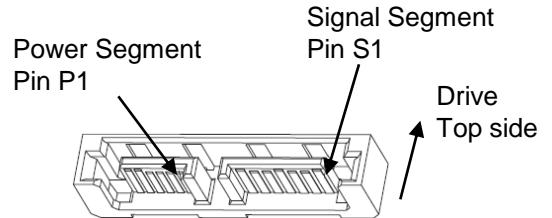
### 12.1 Front View



### 12.2 Rear View



### 12.3 Connector Pin Assignment



	Pin	Function	Cable Usage	Backplane Usage	
Signal Segment	S1	GND	1 <sup>st</sup> mate	1 <sup>st</sup> mate	
	S2	A+	Differential signal pair from host controller.	2 <sup>nd</sup> mate	
	S3	A-		2 <sup>nd</sup> mate	
	S4	GND	1 <sup>st</sup> mate	1 <sup>st</sup> mate	
	S5	B-	Differential signal pair to host controller	2 <sup>nd</sup> mate	2 <sup>nd</sup> mate
	S6	B+		2 <sup>nd</sup> mate	2 <sup>nd</sup> mate
	S7	GND	1 <sup>st</sup> mate	1 <sup>st</sup> mate	
Power Segment	P1	DP*	Device Present	Last mate	
	P2	+5V		2 <sup>nd</sup> mate	
	P3	+5V		2 <sup>nd</sup> mate	
	P4	DA*	Device Attention	2 <sup>nd</sup> mate	
	P5	GND		1 <sup>st</sup> mate	
	P6	GND		1 <sup>st</sup> mate	

\*Pull down DP pin with 1kohm(+/-10%) resistor in ODD.

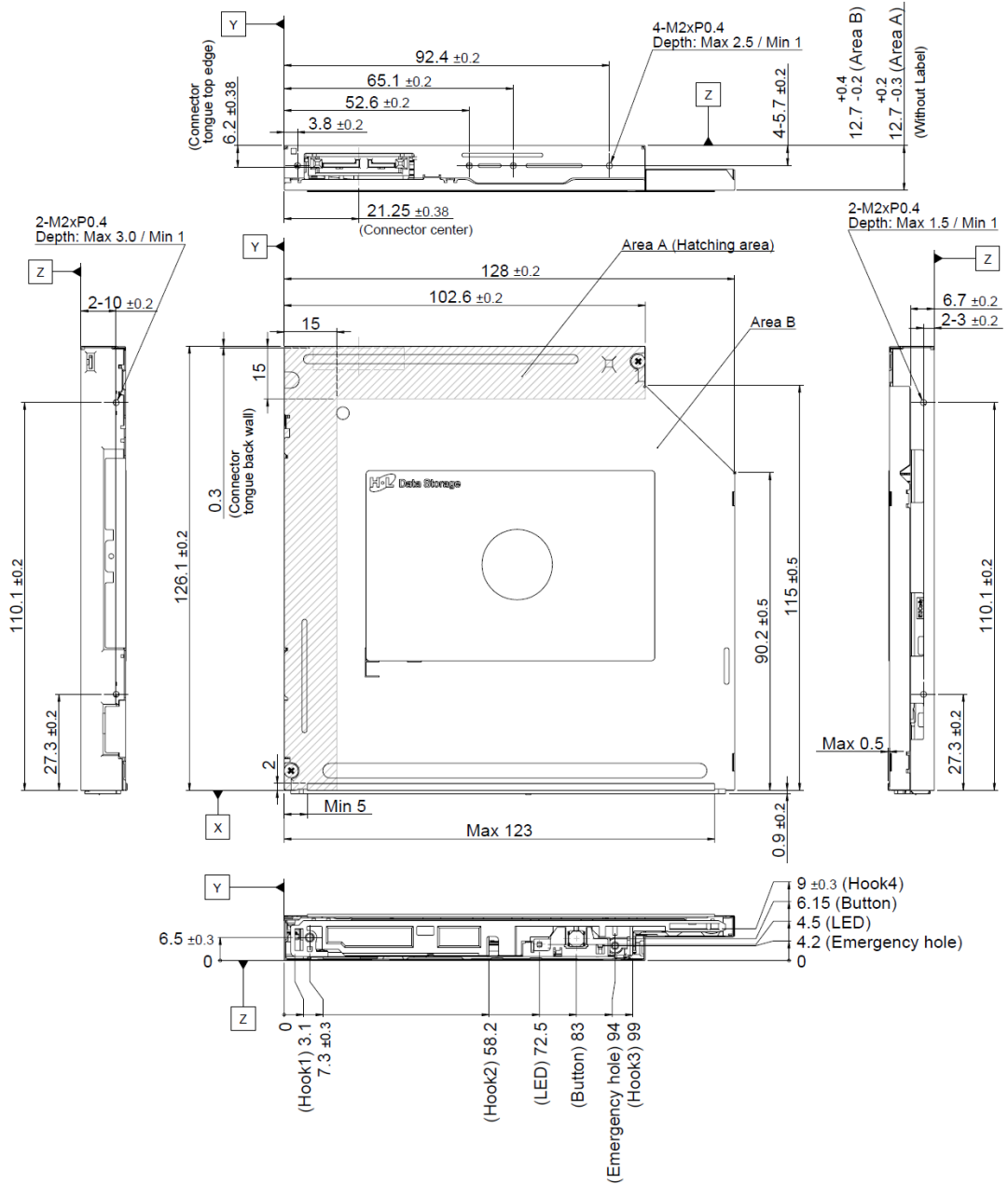
\*DA pin caution: Keep DA pin to be Pull-up for ZPO or External Eject support.

\*DP pin caution: Keep DP pin to be Open state in Host side if no need Hot Swap.

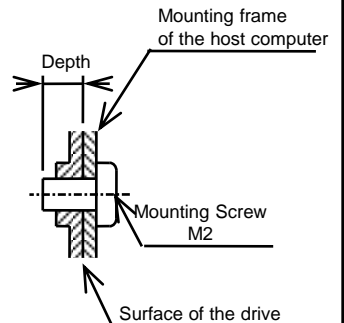
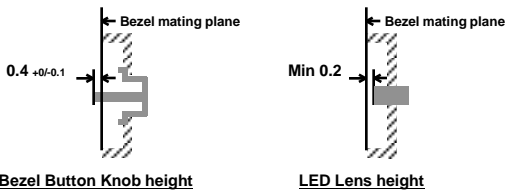


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### 13. Mechanical Dimensions



**\* Bezel design recommendation for Button & LED area**

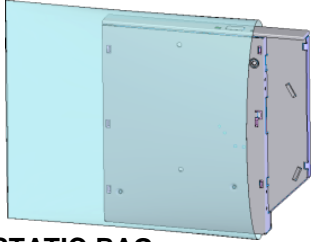


**Notes**

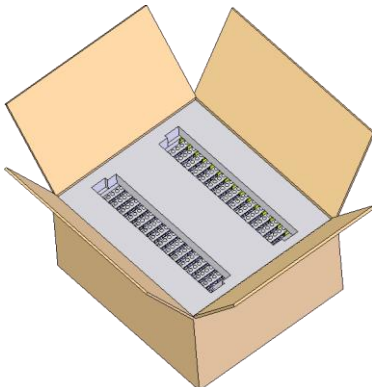
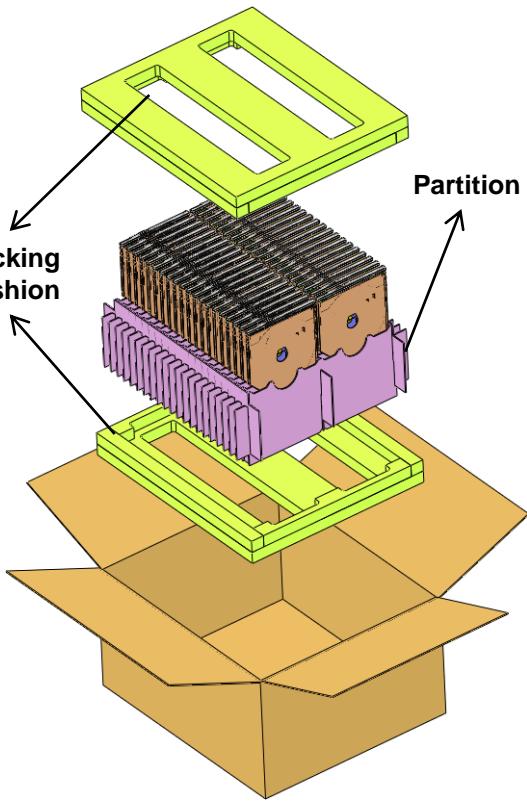
1. M2 tapped holes for installation (Clamping Torque 2.0kgf-cm MAX.)
2. Unless otherwise specified, dimensional tolerance are +/-0.5mm.
3. Bezel design has to follow GBAS Spec which is specified in SFF-8552

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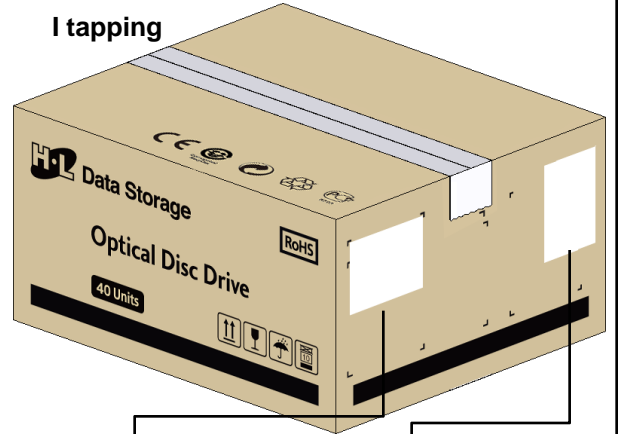
14. Packaging



ANTI-STATIC BAG

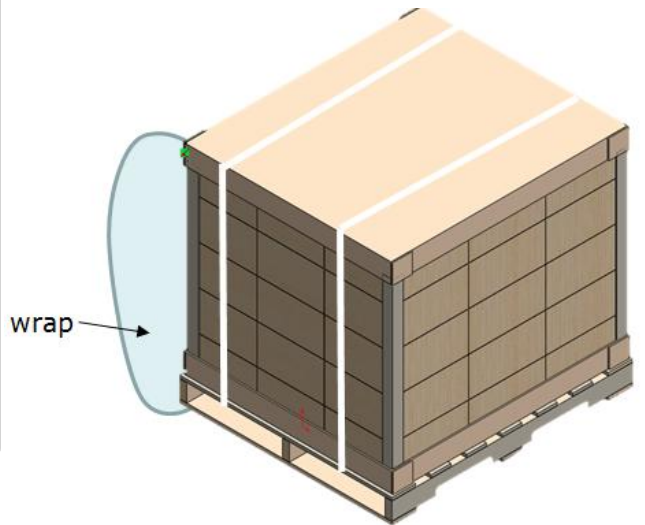


40units/box  
386 x 335 x 195 (Outer size)



Area of box label  
Size : 90 x 60

Area of destination label  
(Only HEPM)



1,800 units/Pallet  
1220 x 1070 x 1120(mm)

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**15. Supported Command List**

**15.1 ATA Commands**

<b>&lt; Command &gt;</b>	<b>&lt; Code &gt;</b>
(1) ATAPI Packet Command	A0h
(2) ATAPI Soft Reset	08h
(3) Check Power Mode	E5h
(4) Execute Drive Diagnostics	90h
(5) Flush Cache	E7h
(6) Identify Packet Device	A1h
(7) Idle Immediate	E1h
(8) NOP	00h
(9) Set Features	EFh
(10) Sleep	E6h
(11) Standby Immediate	E0h
(12) Standby	E2h

**15.2 ATAPI Packet Commands**

<b>&lt; Command &gt;</b>	<b>&lt; Code &gt;</b>
(1) BLANK	A1h
(2) CLOSE TRACK/RZONE/SESSION/BORDER	5Bh
(3) FORMAT UNIT	04h
(4) GET CONFIGURATION	46h
(5) GET EVENT STATUS NOTIFICATION	4Ah
(6) GET PERFORMANCE	ACh
(7) INQUIRY	12h
(8) MECHANISM STATUS	BDh
(9) MODE SELECT (10)	55h
(10) MODE SENSE (10)	5Ah
(11) PAUSE/RESUME	4Bh
(12) PLAY AUDIO (10)	45h
(13) PLAY AUDIO (12)	A5h
(14) PLAY AUDIO MSF	47h
(15) PLAY AUDIO TRACK RELATIVE (10)	49h
(16) PLAY AUDIO TRACK RELATIVE (12)	A9h
(17) PREVENT ALLOW MEDIUM REMOVAL	1Eh
(18) READ (10)	28h
(19) READ (12)	A8h
(20) READ BUFFER	3Ch
(21) READ BUFFER CAPACITY	5Ch
(22) READ CAPACITY	25h
(23) READ CD	BEh
(24) READ CD MSF	B9h
(25) READ DISC INFORMATION	51h
(26) READ DVD STRUCTURE	ADh
(27) READ FORMAT CAPACITIES	23h
(28) READ HEADER	44h
(29) READ SUB-CHANNEL	42h
(30) READ TOC/PMA/ATIP	43h
(31) READ TRACK/RZONE INFORMATION	52h
(32) REPAIR RZONE	58h
(33) REPORT KEY	A4h

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<b>&lt; Command &gt;</b>	<b>&lt; Code &gt;</b>
(34) REQUEST SENSE	03h
(35) RESERVE TRACK/RZONE	53h
(36) SCAN	BAh
(37) SEEK	2Bh
(38) SEND CUE SHEET	5Dh
(39) SEND DVD STRUCTURE	BFh
(40) SEND KEY	A3h
(41) SEND OPC INFORMATION	54h
(42) SET CD SPEED	BBh
(43) SET READ AHEAD	A7h
(44) SET STREAMING	B6h
(45) START/ STOP UNIT	1Bh
(46) STOP PLAY/SCAN	4Eh
(47) SYNCHRONIZE CACHE	35h
(48) TEST UNIT READY	00h
(49) VERIFY(10)	2Fh
(50) VERIFY(12)	AFh
(51) WRITE(10)	2Ah
(52) WRITE(12)	AAh
(53) WRITE AND VERIFY(10)	2Eh
(54) WRITE BUFFER	3Bh

## 15.3 S-ATA function

SSC (Spread Spectrum Clocking)	Disable
CONT Primitive	Enable
Asynchronous signal recovery (Hot Plug)	Enable
Software Setting Preservation	Enable
Phy Event Counter	Enable
HIPM (Host Initiated Power Management)	Disable
DIPM (Device Initiated Power Management)	Enable
Asynchronous notification	Enable
BIST-L	Enable
BIST-TSA	Enable

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## 16. Regulations and Standards

### 16.1 Safety

*The product will satisfy the safety standards outlined below.*

UL  
TUV  
SEMKO  
CB & IEC60825-1 Report  
FDA  
SONCAP  
CNAS

### 16.2 EMC / EMI

*The product complies with applicable technical requirements as specified below*

KC  
BSMI  
CE  
FCC  
VCCI  
C-TICK  
CU

### 16.3 Laser safety

*The product will satisfy all the requirements for the laser specified below.*

Class 1 laser product comply with DHHS rules 21 CFR Subchapter J  
Class 1 laser product to EN60825-1 / IEC 60825-1

## 17. Supporting Operating System & Recording tool

### 17.1 Operating System

Windows 8.1 x86/x64  
Windows 8 x86/x64  
Windows 7 x86/x64  
Windows Vista™ Home Basic, Home Premium, Business, Ultimate Edition  
Windows XP Home Edition, Professional, Media Center Edition  
Windows Server 2012 x64, R2  
Windows2008 Server x86/x64, R2  
Windows2003 Server x86/x64

### 17.2 Recording tool

- (1) Roxio Creator
- (2) CD/DVD Maker (NTI)
- (3) CD File (NTI)
- (4) CyberLink (Power2Go)
- (5) Nero (Ahead)

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## 18. Caution

To use the drive safely and properly, the following precaution should be reserved.

### 18.1 Safety

#### (1) Disassembling and Modification

The drive includes Laser Diodes.

The disc rotates at high speed when the power is supplied to the drive.

Do not disassemble or modify the drive when the power is supplied.

Also the modified drives should be under the responsibility of the company or the persons who modified it.(Firmware issue should be specified separately.)

#### (2) POWER

Do not use the power supply other than the specific voltage(+5V DC).

#### (3) Reserve the following instructions to avoid the electrical short or the damages.

- Do not dispose the drive to the water or the high humidity
- Do not open or remove the cover.
- Do not remove the front bezel.
- Do not let any liquid or foreign substances in the drive.
- Do not put heavy things on the drive.

#### (4) In the case of the failure

In case of the following conditions, turn off the SYSTEM including the Drive

And unplug the power supply cable of the SYSTEM from the wall outlet immediately.

- Do not disassemble or repair the drive by yourself.
- When some liquid or some foreign substances is in the drive.
- When the drives are wet by the water.
- When the drive is dropped
- When the performance of the drive is extremely degraded or when the drive does not work properly.

### 18.2 Dust

We can't guarantee about dirt in the state without a bezel.

The guarantee environment of dirt is a thing under the environment of 0.15 mg/m<sup>3</sup>.

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## Appendix 1. Bezel and Tray, LED, Region

### 1. Bezel, Tray (No Bezel type)

	Part	Color	Material	Flammability
1	Bezel & Eject button	-	-	-
2	Tray	Black	LG Chemical PPE+PS (LUMILOY GN4356FH) U-ONE Com Tech PPE+PS (UWF-02F70) Asahi KASEI PPE+PS (XYRON L544V)	ULV-1

### 2. LED (Brightness and Current are typical value.)

Color	Green
Brightness	20mA 100mcd (LED spec.)
Actual current	17mA (measured by this model)

### 3. LED control

Power on, Disc Recognition:	Flashing
Load:	Flashing
Unload:	On
Data access/ read:	On
Writing:	On
Polling command:	Off
The others:	Off

### 4. Chassis

Top cover	Steel
Bottom cover	Steel

5. Region Setting: No Region

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## Appendix 2. Rating label Specification

### Taiwan 2nd-Tiers LABEL INFORMATION

**LABEL SIZE : 82(W) x 54(H) x 0.1(t)**  
**Printing Information : Blue, Red Part**  
**LABEL P/N : MEZ65063606**

#### \* Label Detail Printed Information \*

1. Product Name : **Super Multi DVD Writer**
2. Model name : **MODEL : GTC0N**
3. Suffix : **(ATWA10B)**
4. 制造日期 (YEAR, MONTH, DATE) : **2016 10 XX**
5. KC No : **KCC-REM-HLD-GTA0N**
6. **ROM VER : XXXX**  
DO NOT PRINT "XXXX" ON MAIN LABEL.  
Please refer to the F/W section or SR PAGE
7. Barcode of Information (39Code)  
**S/N : YYMMFL000001**  
- **YY** : Year (2016 : 16, 2017 : 17, 2018 : 18...)  
- **MM** : Month  
- **FL** : Factory Line Code  
- **000001** : Serial Number
8. **MANUFACTURED : JANUARY 2016**



**Hitachi-LG Data Storage Inc.**

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**Appendix 3. FW Revision History**

Before	after	NO	Issue	Change
-	1.00	1		

**Hitachi-LG Data Storage Inc.**

Issued Date	Jul, 13, 2015	<b>GTC0N. ATWA10B</b>		<b>26/26</b>
Revised Date	Oct, 05, 2016		1.01	

**Appendix 4. HW/Mecha Revision History**

Before	after	NO	Issue	Change
-	A/A	1		

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