

*Liquid Crystal Displays*

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**UC-294**

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*features:*

TN colour

2.9 inch size

Integrated fluorescent backlight tube

Cased or Uncased versions

Runs from standard composite video signal

480 x 130 resolution

CITIZEN WATCH Co.,LTD	PRODUCT SPECIFICATION	MODEL NO.	UC-294-1PA
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LIST OF CHANGES

CHANGE REF.	CONTENTS OF CHANGES	DATE	PERSON

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1. Scope of application

This specification applies to 2.9 inches Color LCD Video unit UC-294-1PA.

2. Composition

This LCD Video unit comprises the following parts.

- ① Completed panel block (including 2nd reflector)
- ② Diffuser

3. Ratings

- 3- 1 Signal mode : In accordance with system PAL-B,G
- 3- 2 Screen size : 58.6mm(H)\*43.8mm(V)
- 3- 3 Recommended cut-off size : 56.3mm(H)\*41.8mm(V)
- 3- 4 Display device : Twisted Nematic color LCD—
  - Prior viewing angle : In a direction of 12 o'clock
  - Picture element form : Rectangle
  - Driving method : 1/65 duty multiplex drive
- 3- 5 Number of pixels : 62400 dots = 480(H) \* 130(V)
- 3- 6 Input signal : Composite video signal  
1.0 V<sub>p-p</sub> (In case of 75 ohm load applied)
- 3- 7 Lighting system : Built-in high luminance fluorescent tube
- 3- 8 Supply voltage : DC 7.5V ± 10%
- 3- 9 Operating temperature : + 5 to +40 °C
- 3-10 Storage temperature : -20 to +60 °C
- 3-11 Overall size : Refer to overall drawing
- 3-12 Weight : Approx. 78 g (without diffuser)

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4. Performance

4-1 Measurement conditions : Supply voltage : 7.5 V ± 2.5%  
 Signal level : 1.0 Vp-p (load applied)  
 Temperature : 25°C ± 2°C  
 Humidity : 65%RH ± 5%RH

4-2 Current consumption : 420 mA or less (Brightness max)

4-3 Picture display field : Horizontal 13.2 ~ 60.6 μSec  
 : Vertical 37 ~ 298 H (1 Field)

4-4 Gradation : In the case of 8 gray levels being inputted,  
 more than 6 Gradations must be displayed.  
 2(White):4(Gray):2(Black)  
 Pattern generator : 408NPS (Made by LEADER Co.)  
 ◇PATTERN:FULL COLOR BAR ◇CHROMA:OFF  
 ◇ WHITE:75% ◇ SETUP:7.5%

4-5 Contrast ratio (Completed state)

$$CR (MAX) = \frac{\text{Brightness of white level}}{\text{Brightness of black level}} = 6 \text{ (Typ.) } (\theta=0, \phi=0)$$

4-6 Viewing angle range (Completed state) (See Fig. 1)

Vertical Viewing angle range  $\theta_1$  : +10~-20 deg. (Typ. ,  $\phi=0$ , CR>2)  
 Horizontal Viewing angle range  $\theta_2$  : -40~+40 deg. (Typ. ,  $\phi=90$ , CR>2)

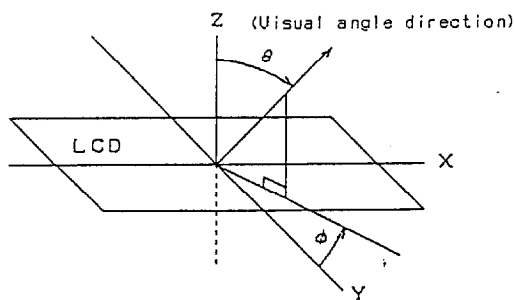


Fig. 1

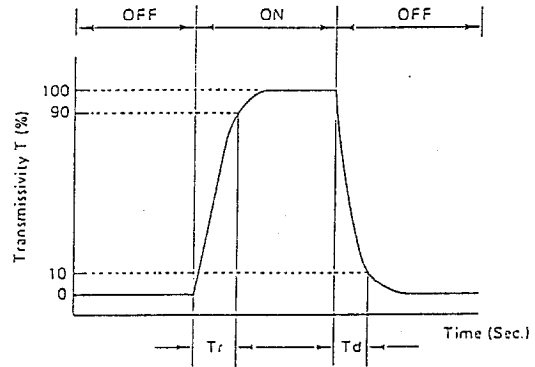
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4-7 Response time

Tr:120msec or more ( $\theta=0, \phi=0$ )

Td:120msec or more ( $\theta=0, \phi=0$ )

- Tr=A time in transmissivity changes to 90% when applied voltage has been changed from Voff to Von.
- Tr=A time in transmissivity changes to 10% when applied voltage has been changed from Von to Voff.



4-8 Lighting unit

Measurement conditions : • Luminance meter nt-1° P (Made by Minolta Camera Co.)  
 • in 5 minutes after lighting  
 • Temperature :  $25 \pm 2^\circ\text{C}$   
 • Humidity :  $65 \pm 5\%RH$

Average Brightness : 4000 nit or more  
 • Average at 5 points on specified diffuser plate surface. (See Fig. 2)

Uneven Brightness : -30 % to +30%  
 • 5 points on specified diffuser plate surface.

Life time of fluorescent tube : 4000 hours in continuous lighting (Typ.)

The life time means a case where one of two items described below comes under.

- ①when the center brightness of straight tube has reached 70% of the initial value.
- ②when an effective luminous length has become 80% of already-set value(51mm).

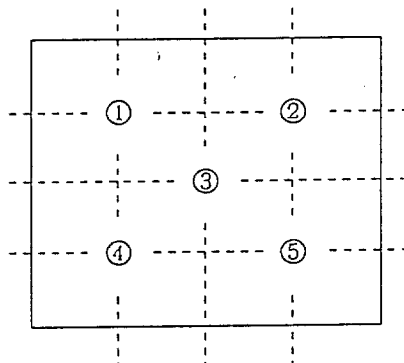
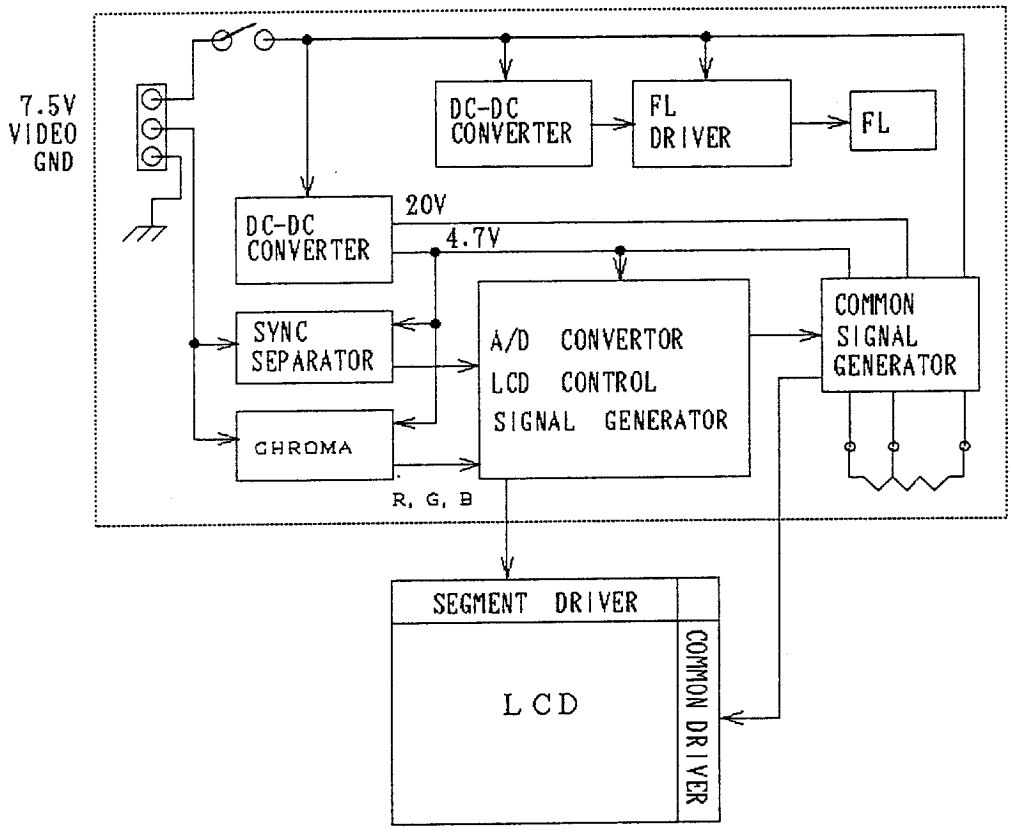


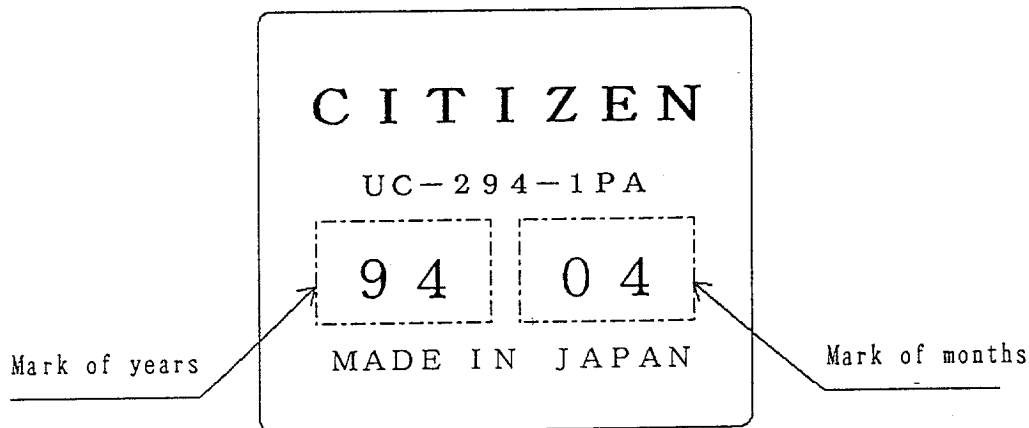
Fig. 2

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5. Block Diagram



6. Lot marking



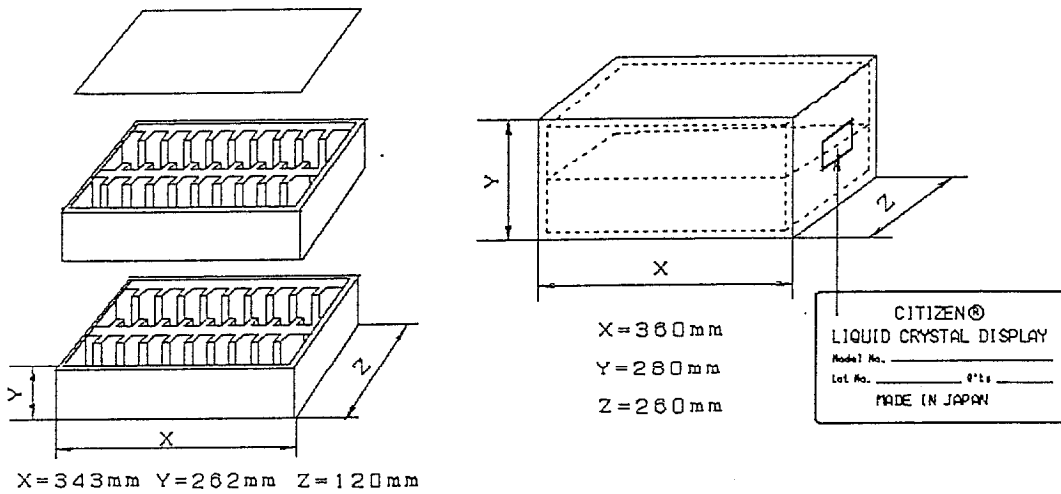
When there is a requirement for special identification on the product, the marking method will be determined by discussion between CITIZEN WATCH Co. Ltd. and the customer.

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7. Packaging specification

7-1 Completed panel block Packaging specification

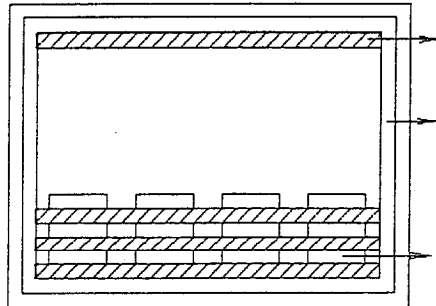
One units is put in antistatic polyethylene bag and 20 units are inserted into one shipping case made of styrene foam as shown in the left illustration below.  
For normal delivery, 40 units in all are packaged in a carton.



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7-2 Diffuser Packaging specification

Cross section

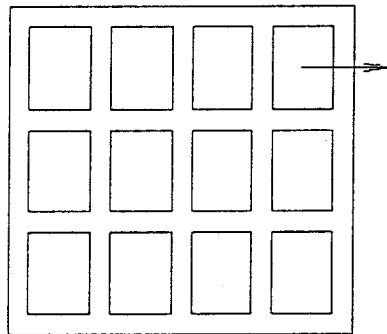


Fender Pile

Inside Dimension of Double Corrugated Cardboard  
311(V) x 311(H) x 169(H) mm

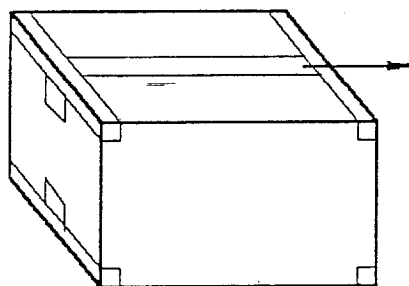
Diffuser  
12 pcs. x 50 step = 600 pcs.

Top View



Diffuser

Assembly Drawing



Tape

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8. Cautions

8-1 Cautions for use

- (1) A polarizer is kept mounting on the surface of LCD panel and before shipping, the polarizer at the surface side is covered with a protective sheet. Before using, take off the protective sheet. A failure to remove the sheet may result in the displayed picture taking an unnecessary color or stripes coming into view.
- (2) Before applying the supply voltage or video signal, make sure the power supply connected to the video unit and the wiring of video signal are right. If the voltage is applied without taking note of the fact that the connection is improper, the unit may break down.
- (3) A semi-fixed resistor on PCB has already been adjusted to enable the most favorable picture to be obtained. Don't touch the semi-fixed resistor anyway. For readjustment, a special measuring instrument is necessary.
- (4) Don't use this LCD video unit in a wet condition with dew; otherwise the unit may break down.

8-2 Cautions in handling

- (1) Handle the polarizer with the greatest possible care since it is prone to damage. Do not place a hard, pointed article such as metallic tweezers to the polarizer and do not push or rub the polarizer with any foreign object.
- (2) Be careful not to touch the polarizer with the bare hand. If the polarizer is found dirty, clean it with an absorbent cotton swab or a soft cloth by wiping gently with five percent weak diluted solution of a neutral detergent. Do not use such chemicals as acetone, ethanol, toluen, isopropyl alcohol and so on for cleaning ; otherwise, a reaction phenomenon occurs and deterioration may result.
- (3) Also, if saliva or water droplets are left on the surface of the polarizer for a long time, it may become deformed or discolored. So, remove them right away.
- (4) If the LCD panel has been broken and the liquid crystal substance has leaked out, avoid inhaling or touching it. If the liquid crystal substance has contacted the skin or clothes, wash it away quickly.

8-3 Cautions in mounting

- (1) For the packaging substrate, IC, etc. which are sensitive to static electricity are in use. So, handle them with the greatest possible care.
- (2) Mount the completed panel block and diffuser being careful not to bend or twist unduly. Otherwise, LCD panel could get cracked or the circuit might break down.

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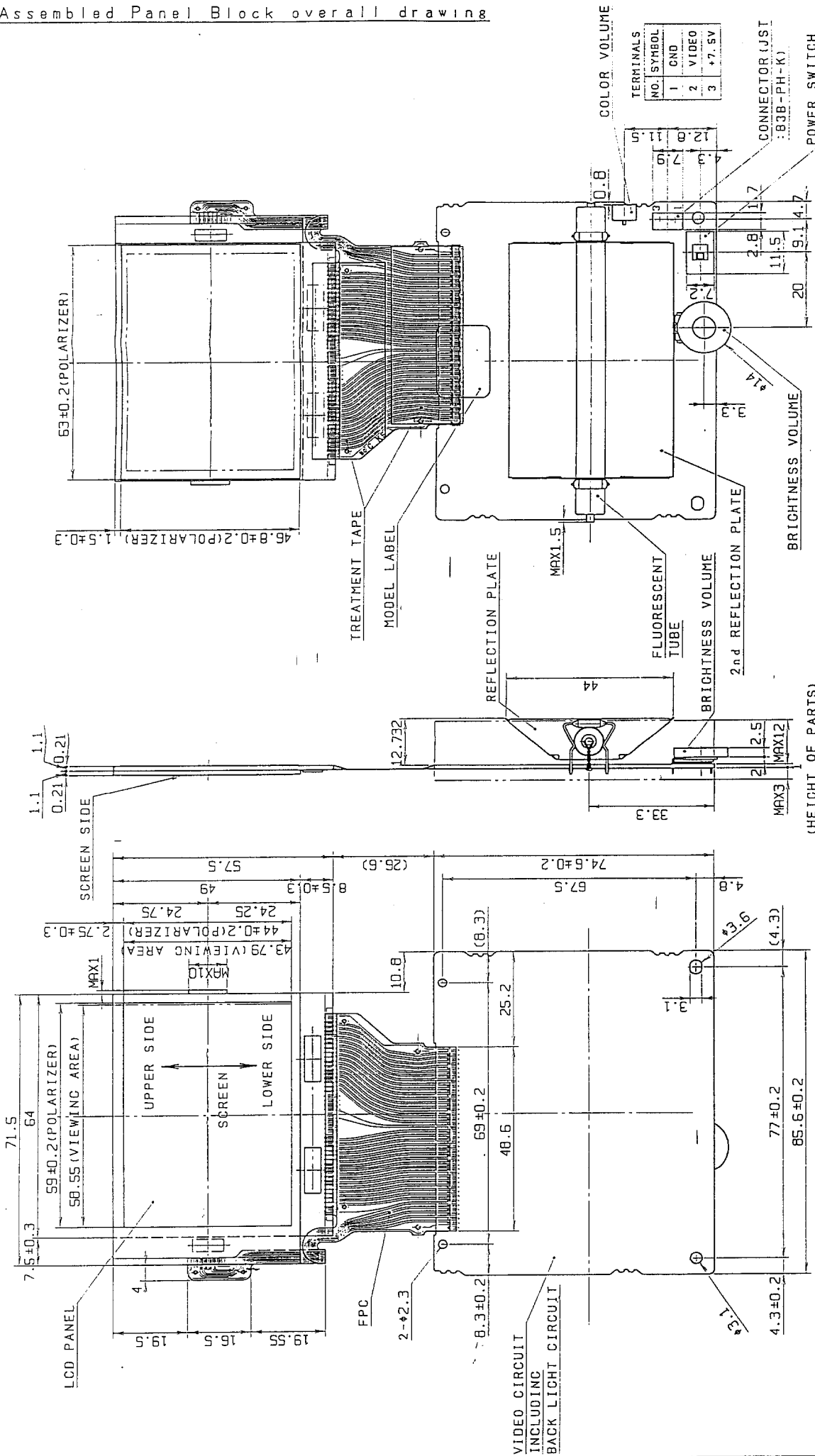
- (3) For protecting LCD panel, especially the polarizer surface, attach a transparent protective board (for example, an acrylic board or glass board) to the product case.
- (4) Mount the completed panel block on place immediately after taking it out of a antistatic polyethylene bag.

8-4 Cautions in storage

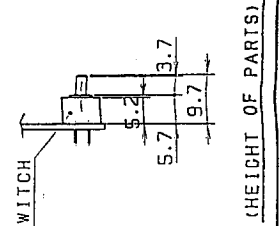
- (1) Avoid keeping the unit in a humid place with high temperature.
- (2) Do not expose the unit to direct sunlight.
- (3) Take the proper steps to prevent any unnecessary pressure on the unit.
- (4) Keep the completed panel block in a specified packaged form unless otherwise being built in place soon.

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Assembled Panel Block overall drawing



Quantity	Unit	1/1 mm
Scale	Scale	1/1
Model:	UC-294-1PA	
Parts No.:	Glass Dimensions	
Drawn	Date	Name
Checked	95. 8. 10	Y. MATSUHARA
Approved	Parts Name:	
Material	LCD VIDEO UNIT	
Heat Treatment	Drawing No.:	
Hardness	CITIZEN	
Plating	CITIZEN WATCH CO., LTD.	
General Tolerances	TOKYO, JAPAN	
Dimensions		
Angles		



- (REMARKS)
01. VIDEO UNIT CONSISTS OF BOTH ASSEMBLED PANEL BLOCK AND DIFFUSION PLATE.
  02. HEIGHT DIMENSION OF PARTS INCLUDE GAP 0.2mm BETWEEN PART AND PCB BY MOUNTING.

