


NAN YA PLASTICS CORPORATION

SPECIFICATION OF
LCD MODULE
PRODUCT NO.: LT_79_202_1_

SPEC. NO.: LM202-1-

CUSTOMER
APPROVED BY
DATE:

LCD DEPARTMENT
ELECTRONIC MATERIALS DIVISION
NAN YA PLASTICS CORPORATION
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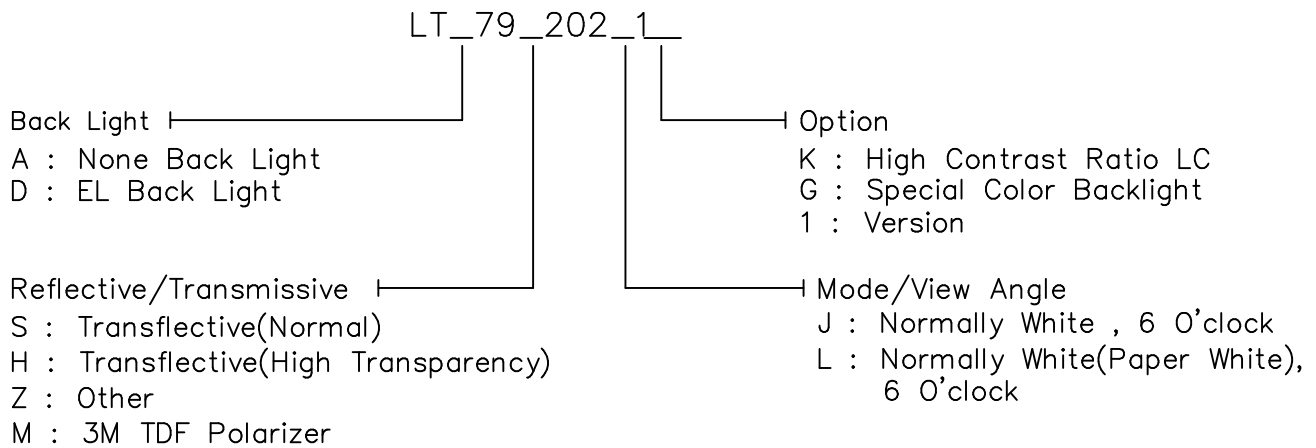
EDITED ON : MAY. 26, 2000

DESIGN MANAGER	DESIGN CHECK	DESIGNER
		M.Y. Lin

1. MECHANICAL DATA

- (1) Product No. LT_79_202_1_
- (2) Module Size 93.8 (W)mm X 75.1 (H)mm X 5.5 (D)mm
- (3) Dot Size 0.225 (W)mm X 0.225 (H)mm
- (4) Dot Pitch 0.24 (W)mm X 0.24 (H)mm
- (5) Number of Dots 320 (W) X 240 (H) Dots
- (6) Duty 1/240
- (7) LCD Display Mode FSTN Black and White(Normally White/Positive Image)
 Black and White(Normally White,Paper White/
Positive Image)
Rear Polarizer: Transflective(Normal)
 Transflective(High Transparency)
- (8) Viewing Direction 6 O'clock
- (9) Backlight EL B/L
- (10) Weight 48 g(Included the EL B/L)
- (11) Controller Excluded
- (12) DC/DC Converter Excluded

Note :



2. ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

VSS=0V

ITEM	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	-0.3	7.0	V	
Power Supply for LC Drive	VEE-VSS	-0.3	30.0	V	
Input Voltage	VI	-0.3	VDD	V	
Static Electricity	-	-	-	-	Note 1

(2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	WIDE TEMP.			
	OPERATING		STORAGE	
	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	-20	70	-30	80
Humidity(Without Condensation)	Note 2,3		Note 2,4	

Note 1 LCM should be grounded during handling LCM.

Note 2 Background color changes slightly depending on ambient temperature.

This phenomenon is reversible.

Note 3 $T_a \leq 70^\circ\text{C}$: 75%RH max

$T_a > 70^\circ\text{C}$: Absolute humidity must be lower

than the humidity of 75%RH at 70°C

Note 4 T_a at -30°C will be < 48hrs, at 80°C will be < 120hrs

3. ELECTRICAL CHARACTERISTICS

(VDD= 3.3V ± 10%)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Input Voltage	VIH	H level	0.8VDD	-	VDD	V	
	VIO	L level	0	-	0.2VDD	V	
Recommended LC Driving Voltage (WIDE TEMP. LCM)	VEE-VSS (Vop) (NOTE1)	1/240 Duty	-20°C	24.2	24.6	25.0	V
			0°C	22.9	23.0	23.4	
		1/13 Bias	25°C	22.3	22.7	23.1	
			50°C	21.1	21.5	21.9	
			70°C	20.3	20.7	21.1	
Power Supply Current	IDD	VDD= 3.3V VSS= 0V VEE-VSS=22.7V FLM=70Hz	-	0.1	0.3	mA	
	IEE	PATTERN : □ ■ □ ■ □ ■ ■ □ ■ □ ■ □	-	0.55	1.0		
Power Supply Current For EL	IEL	AC 100 Vrms 400 Hz	-	8.0	12.0	mA	

4. OPTICAL CHARACTERISTICS

AT V_{OP}

ITEM MODE		Cr(Contrast Ratio)						θ (Viewing Angle)		ϕ (Viewing Angle)	
		0°C		25°C		50°C		25°C		25°C	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
S	J	-	9.0	-	9.0	-	6.0	-	66	-	±41
Z	L	-	8.5	-	9.5	-	7.0	-	75	-	±35
H	L	-	9.0	-	10.0	-	7.0	-	84	-	±39
M	L	-	11.0	-	10.0	-	8.0	-	72	-	±38
NOTE		NOTE6						NOTE5			

NOTE :

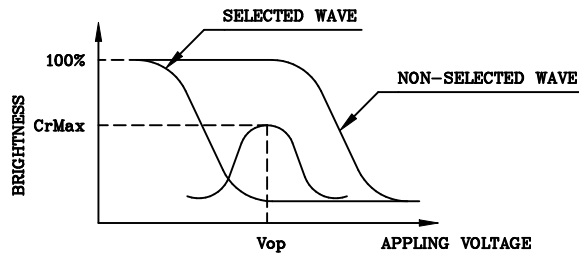
- S: TRANSFLECTIVE(NORMAL)
- H: TRANSFLECTIVE(HIGH TRANSPARENCY)
- Z: OTHER
- M: 3M TDF POLARIZER
- J: NORMALLY WHITE
- L: NORMALLY WHITE(PAPER WHITE)

AT $\phi=0^\circ$ $\theta=0^\circ$

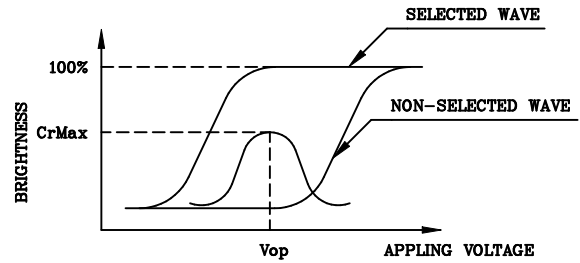
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	-20°C	-	3000	4500	ms	NOTE 2
		0°C	-	1100	1650		
		25°C	-	300	450		
		50°C	-	150	225		
		70°C	-	100	150		
Response Time (fall)	Tf	-20°C	-	2800	4200	ms	NOTE 2
		0°C	-	500	800		
		25°C	-	200	300		
		50°C	-	100	150		
		70°C	-	80	120		

(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



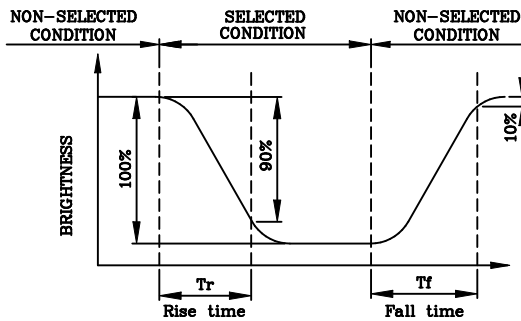
(negative type)

*Conditions

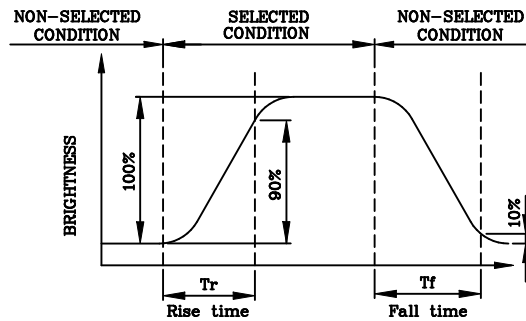
Viewing Angle : 0
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



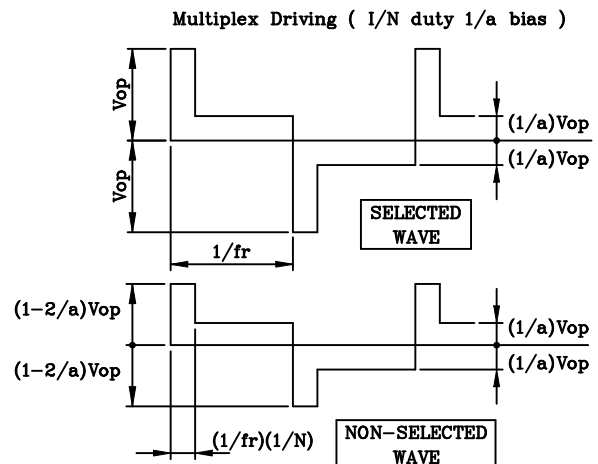
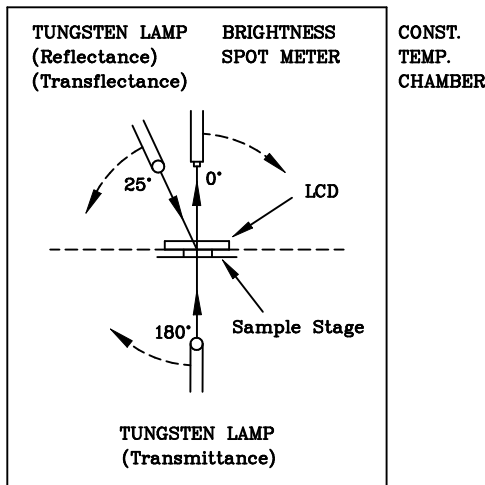
(negative type)

*Conditions

Operating Voltage : Vop
 Viewing Angle (θ,φ) : (0,0)
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias

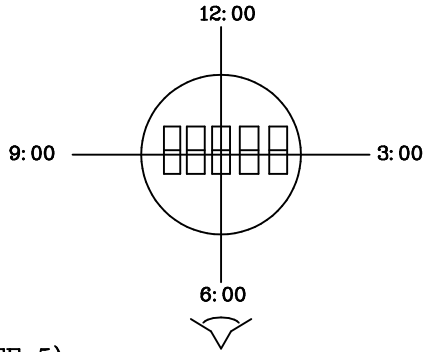
(NOTE 3)

Description of Measuring Equipment and Driving Waveforms



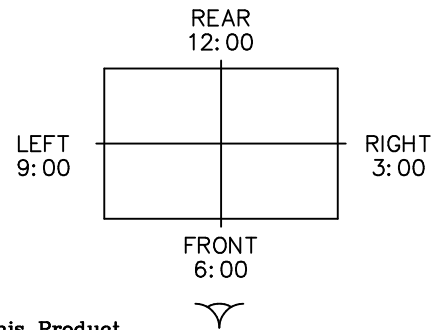
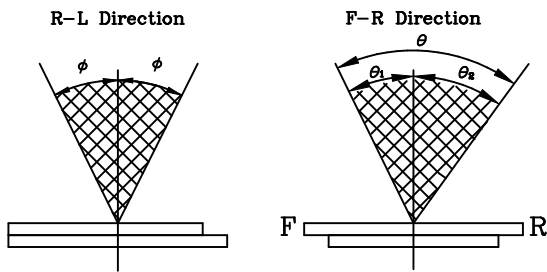
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



*For This Product
 The Viewing Direction Is 6 O'clock
 So $\theta_1 > \theta_2$

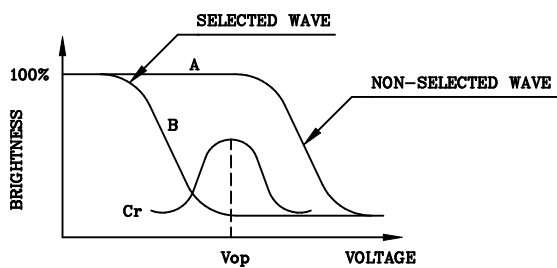
$$\theta = \theta_1 + \theta_2$$

*Conditions

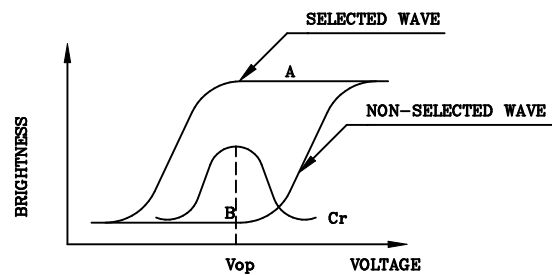
Operating Voltage : V_{op}
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias
 Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



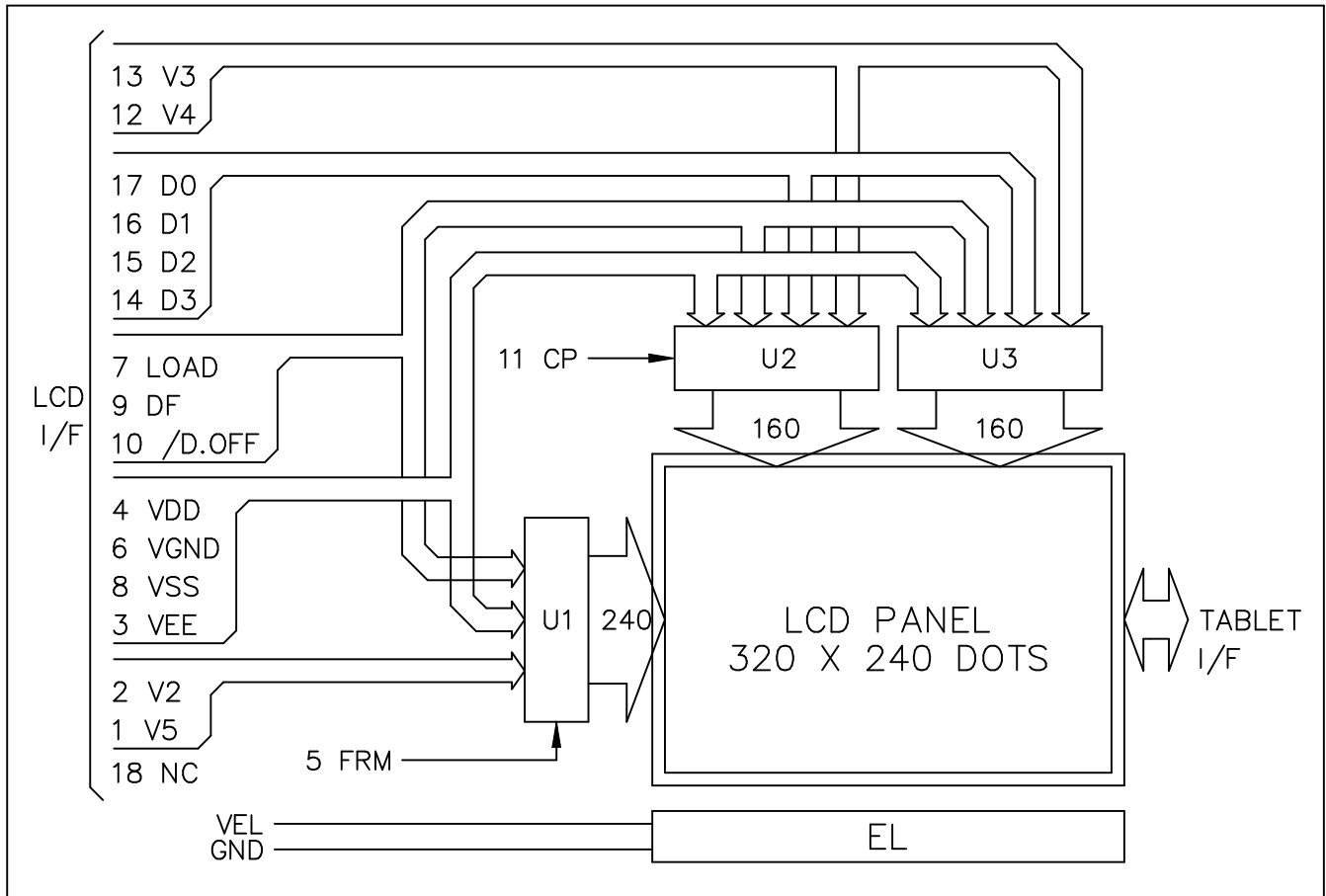
(negative type)

$$\text{Contrast Ratio : } Cr = A/B$$

*Conditions

Viewing Angle : 0
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias

5. BLOCK DIAGRAM



Note1 :

- 1) Controller and bias voltage supply circuit are not included.
- 2) VEE, VGND, V2, V3, V4 and V5 are power supply voltage for LCD.
 (VEE > V2 > V3 > V4 > V5 > VGND)

6. INTERNAL PIN CONNECTION

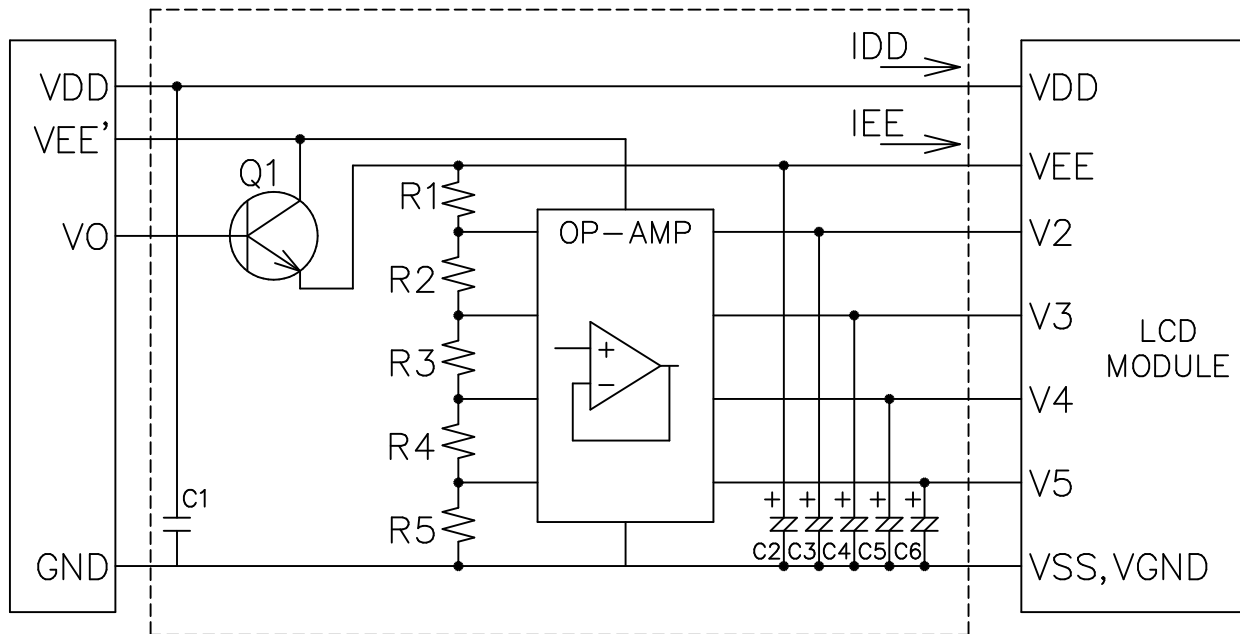
LCD

Pin No.	Symbol	Function
1	V5	Bias voltage for non-select (Common driver)
2	V2	Bias voltage for non-select (Common driver)
3	VEE	Power supply for LCD (+V)
4	VDD	Power supply for logic (+3.3V)
5	FRM	Frame start signal (Data signal of the shift register of the common driver)
6	VGND	GND, Power supply for LCD
7	LOAD	1) Latch pulse of display data 2) Shift clock for common driver
8	VSS	GND
9	DF	Switch signal to convert LCD drive waveform into AC
10	/D.OFF	H : Display ON, L : Display OFF
11	CP	Clock pulse for segment shift register
12	V4	Bias voltage for non-select (Segment driver)
13	V3	Bias voltage for non-select (Segment driver)
14	D3	Input data signal
15	D2	Input data signal
16	D1	Input data signal
17	D0	Input data signal
18	N.C.	No connectoin

TOUCH PANEL

Pin No.	Symbol
1	Y2
2	X2
3	Y1
4	X1

7. POWER SUPPLY



Q1 : 2SC1815

OP-AMP : LP324

$R1=R2=R4=R5=10K\Omega, R3=9R1=91K\Omega(1/13 \text{ Bias})$

$C1=0.1\mu F, C2\sim C6=3.3\mu F$

Note 1 : These are general values.

In case to decrease LCD driving voltage with minimizing bias value, set these values with check display to avoid display's deterioration (response etc).

Note 2 : EL Driving Method

a. Constant Voltage Source Driving : AC 100 Vrms 400 Hz

b. Inverter IC Driving : HV823(Supertex) or SP4428CN(Sipex)

8. TIMING CHARACTERISTICS

8-1 INTERFACE TIMING

@ VDD=3.3V±10%, Ta=-20~70 °C

Item	Symbol	Test condition	Min.	Typ.	Max.	Unit
CP Cycle Time	t _C	Fig.a	82	-	-	ns
CP Pulse Width	t _{SWH} ,t _{SWL}	Fig.a	28	-	-	ns
CP Rise/Fall Time	t _{CR} ,t _{CF}	Fig.a	-	-	50	ns
Data Set Up Time	t _{DSU}	Fig.a , Fig.b	20	-	-	ns
Data Hold Time	t _{DHD}	Fig.a , Fig.b	23	-	-	ns
LOAD Cycle Time	t _L	Fig.b	250	-	-	ns
LOAD "H" Pulse Width	t _{LWH}	Fig.a , Fig.b	30	-	-	ns
LOAD Rise/Fall Time	t _{LR} ,t _{LF}	Fig.b	-	-	50	ns
CP To LOAD Delay Time	t _{CL}	Fig.a	30	-	-	ns
LOAD To CP Delay Time	t _{LC}	Fig.a	65	-	-	ns
FRM TO LOAD SETUP TIME	t _{FLS}	Fig.b	30	-	-	ns
FRM TO LOAD HOLD TIME	t _{FLH}	Fig.b	50	-	-	ns

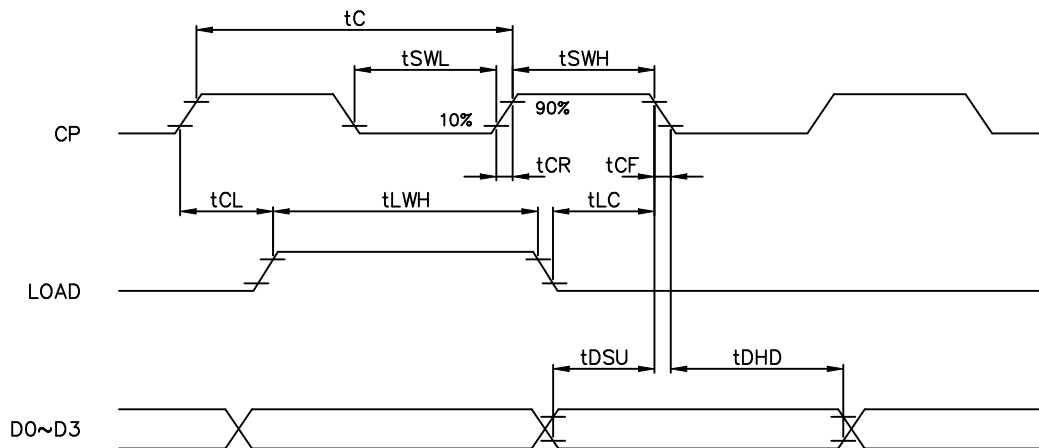


Fig . a Interface timing (SEGMENT)

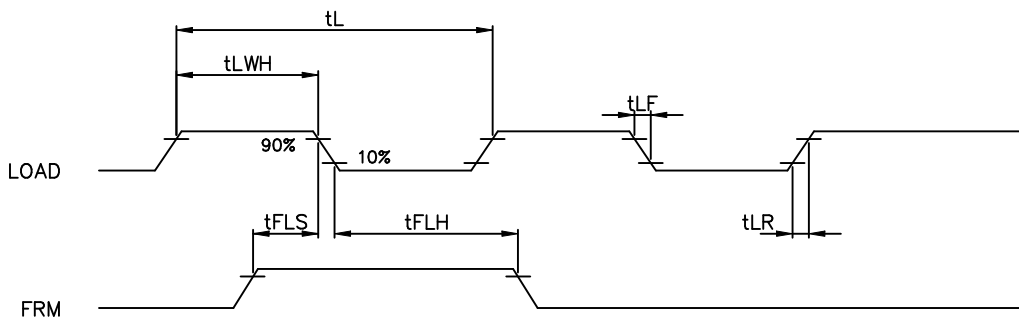
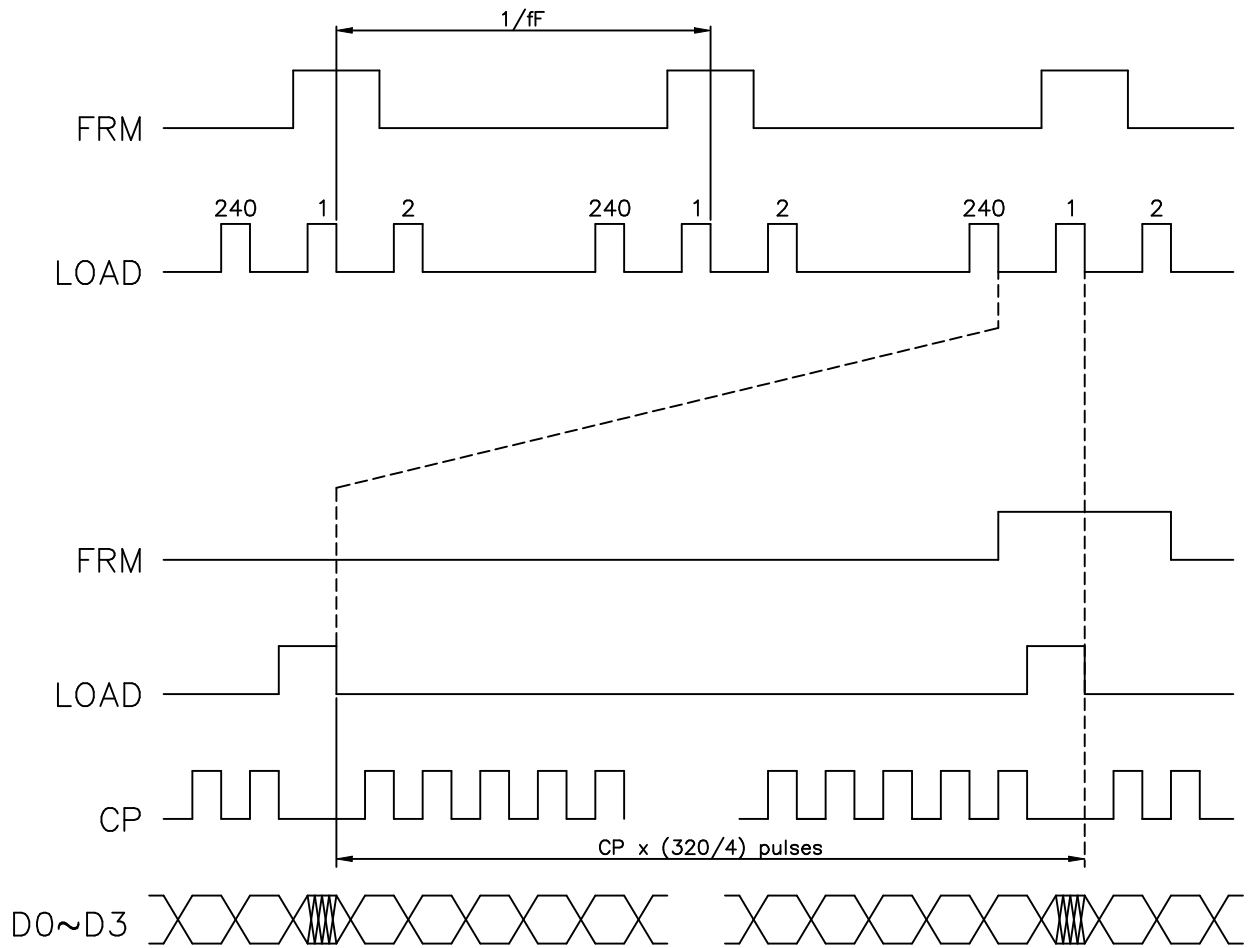
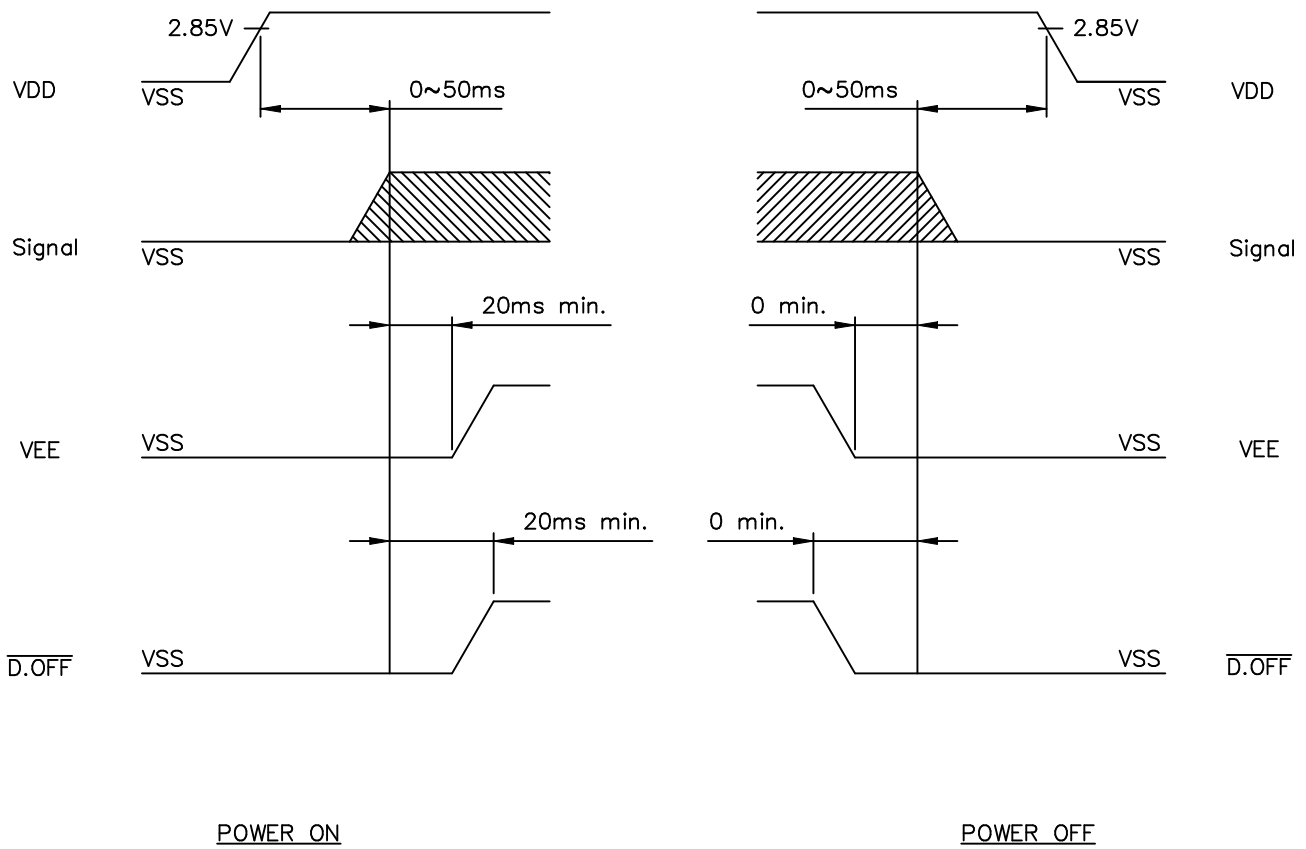


Fig . b Interface timing (COMMON)

8-2 TIMING CHART OF INPUT SIGNAL



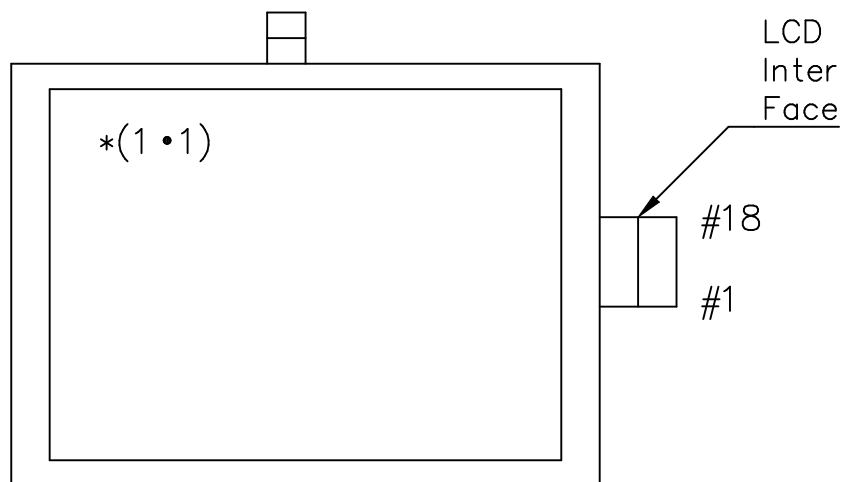
8-3 POWER ON/OFF TIMING



The missing pixels may occur when the LCM is driven beyond above power interface timing sequence.

8-4 DISPLAY PATTERN

	Column1	Column2	Column3	Column4	Column320
Row 1	1•1	1•2	1•3	1•4	1•320
Row 2	2•1	2•2	2•3		
Row 3	3•1	3•3			
	D0: (1•4)↘(1•8)(240•320) D1: (1•3)↘(1•7)(240•319) D2: (1•2)↘(1•6)(240•318) D3: (1•1)↘(1•5)(240•317)				
Row 240	240•1				240•320



9. RELIABILITY TEST

NO	ITEM	CONDITION			STANDARD	NOTE
1	HIGH TEMP. STORAGE	70°C	120HR		Appearance without defect	
2	LOW TEMP. STORAGE	-20°C	120HR		Appearance without defect	
3	HIGH TEMP. & HIGH HUMI. STORAGE	40°C 90%RH	120HR		Appearance without defect	
4	THERMAL SHOCK	-20°C, 30min → 25°C, 5min → 70°C, 30min → 25°C, 5min (1cycle)			Appearance without defect	5 cycles

Inspection Provision

1. Purpose

The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

2. Applicable Scope

The NAN YA inspection provision is applicable to the arrangement in regard to outgoing inspection and quality assurance after outgoing.

3. Technical Terms

3-1 NAN YA Technical Terms



4. Outgoing Inspection Provision

Outgoing inspection is according to the product inspection manual.
(Per 1-1, 1-2 & 1-3)

4-1 Inspection Method

MIL-STD-105D Level II Regular inspection

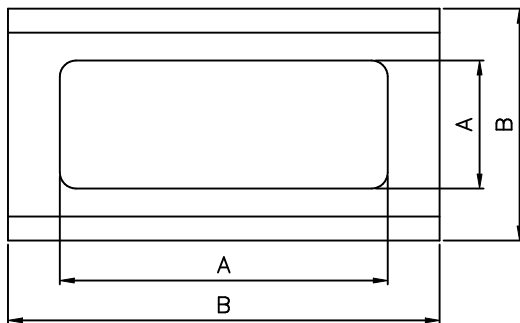
4-2 Inspection Standard

	Item		AQL(%)	Remarks
Major Defect	Dots	Opens Shorts Erroneous operation	0.4	faults which substantially lower the practicality and the initial purpose difficult to achieve.
	Solder appearance	Shorts Loose		
	Cracks	Display surface cracks		
	Tablet contact resistance			
	Tablet input load			

		Tablet lineality		0.4	
		Dimensions	External from Dimensions	0.4	
Minor Defect	Inside the glass		Black spots	0.65	faults which appear to pose almost no obstacle to the practicality, effective use, and operation.
	Polarizing plate		Scratches, foreign Matter, air bubbles, and peeling		
	Dots		Pinhole, deformation		
	Color tone		Color unevenness		
	Solder appearance		Cold solder Solder projections		

4-3 Inspection Provisions
*Viewing Area Definition

Fig. 1



A : Zone Viewing Area
B : Zone Glass Plate Out Line

*Inspection place to be 500 to 1000 lux illuminance uniformly without glaring.

The distance between luminous source(daylight fluorescent lamp and cool white fluorescent lamp) and a sample to be 30cm to 50cm.

*Test and measurement are performed under the following conditions, unless otherwise specified.

Temperature	20± 15°C
Humidity	65± 20%R.H..
Pressure	860~1060hPa(mmbar)

In case of doubtful judgment, it is performed under the following conditions.

Temperature	20± 2°C
Humidity	65± 5%R.H..
Pressure	860~1060hPa(mmbar)

5.Specification for quality check

5-1 Electrical characteristics

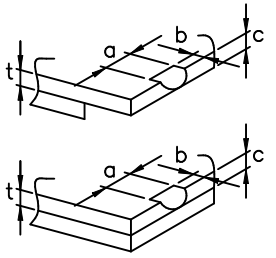
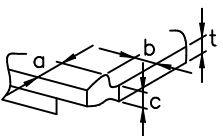
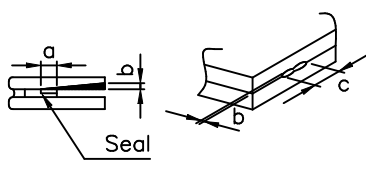
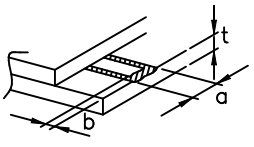
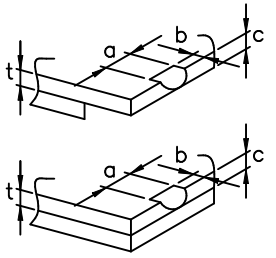
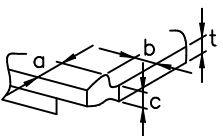
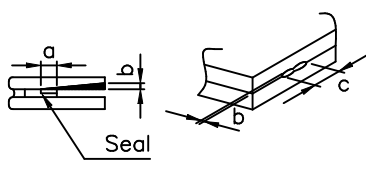
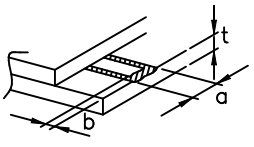
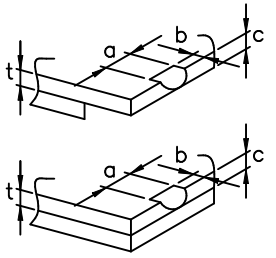
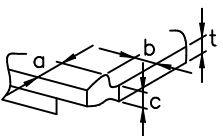
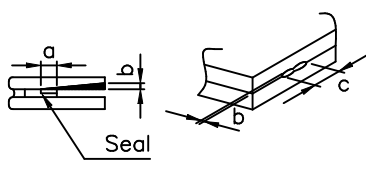
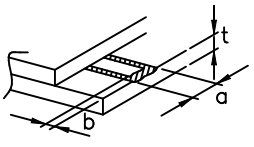
NO.	Item	Criterion
1.	Non operational	Fail
2.	Miss operating	Fail
3.	Missing dot	Fail
4.	Contrast irregular	Not allowable
5.	Response time	Within Specified value
6.	Tablet contact resistance	Within Specified value
7.	Tablet input load	Within Specified value
8.	Tablet lineality	Within Specified value
9.	EL backlight turn on/off	Within Specified value

5-2 External Appearance Defect

NO.	Item	Criterion																		
1.	Black spots, foreign matter, and white spots (Including light leakage due to pinholes of polarizing plates, etc.)	<p>(1)-1-Spots(At non lighting condition)</p> <table border="1" data-bbox="730 477 1377 763"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.1$</td> <td>Ignore</td> </tr> <tr> <td>$0.1 < D \leq 0.2$</td> <td>5</td> </tr> <tr> <td>$0.2 < D \leq 0.3$</td> <td>2</td> </tr> <tr> <td>$0.3 < D$</td> <td>0</td> </tr> </tbody> </table> <p>Number of total pieces is set to within 5 pieces.</p> <p>Note that when there are 2 pieces or more, they are not to be concentrated. Set as: Average diameter = (Long diameter + Short diameter)/2</p> <p>(1)-2-Spots(At lighting condition)</p> <table border="1" data-bbox="730 1189 1377 1429"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.3$</td> <td>Ignore</td> </tr> <tr> <td>$0.3 < D \leq 0.75$</td> <td>5</td> </tr> <tr> <td>$0.75 < D$</td> <td>0</td> </tr> </tbody> </table> <p>Number of total pieces is set to within 5 pieces.</p> <p>Note that when there are 2 pieces or more, they are not to be concentrated. Set as: Average diameter = (Long diameter + Short diameter)/2</p>	Average Diameter(mm):D	Number of pieces permitted	$D \leq 0.1$	Ignore	$0.1 < D \leq 0.2$	5	$0.2 < D \leq 0.3$	2	$0.3 < D$	0	Average Diameter(mm):D	Number of pieces permitted	$D \leq 0.3$	Ignore	$0.3 < D \leq 0.75$	5	$0.75 < D$	0
Average Diameter(mm):D	Number of pieces permitted																			
$D \leq 0.1$	Ignore																			
$0.1 < D \leq 0.2$	5																			
$0.2 < D \leq 0.3$	2																			
$0.3 < D$	0																			
Average Diameter(mm):D	Number of pieces permitted																			
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$0.3 < D \leq 0.75$	5																			
$0.75 < D$	0																			

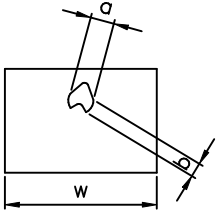
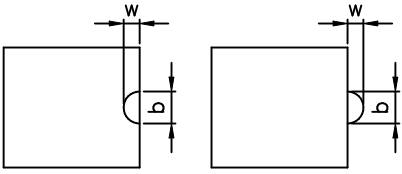
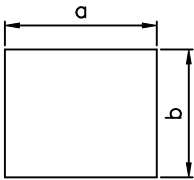
SPECIFICATION

<p>1. Black spots, foreign matter, and white spots (Including light leakage due to pinholes of polarizing plates, etc.)</p>	<p>(1)-1 Spots(At non lighting condition)</p> <table border="1" data-bbox="730 427 1473 712"> <thead> <tr> <th>Width(mm): W</th> <th>Length(mm):L</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.03$</td> <td>Ignore</td> <td>Ignore</td> </tr> <tr> <td>$0.03 < W \leq 0.08$</td> <td>$L \leq 4$</td> <td>2</td> </tr> <tr> <td>$0.08 < W \leq 0.1$</td> <td>$L \leq 1$</td> <td>1</td> </tr> </tbody> </table> <p>Object exceeding 0.1mm follow the standards of the spots form. Note that when there are 2 pieces or more, they are not to be concentrated.</p> <p>(1)-2 Spots(At lighting condition)</p> <table border="1" data-bbox="730 1016 1473 1301"> <thead> <tr> <th>Width(mm): W</th> <th>Length(mm):L</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.03$</td> <td>Ignore</td> <td>Ignore</td> </tr> <tr> <td>$0.03 < W \leq 0.08$</td> <td>$L \leq 3$</td> <td>6</td> </tr> <tr> <td>$0.08 < W$</td> <td>$3 < L$</td> <td>None</td> </tr> </tbody> </table> <p>Object exceeding 0.1mm follow the standards of the spots form. Note that when there are 2 pieces or more, they are not to be concentrated.</p>	Width(mm): W	Length(mm):L	Number of pieces permitted	$W \leq 0.03$	Ignore	Ignore	$0.03 < W \leq 0.08$	$L \leq 4$	2	$0.08 < W \leq 0.1$	$L \leq 1$	1	Width(mm): W	Length(mm):L	Number of pieces permitted	$W \leq 0.03$	Ignore	Ignore	$0.03 < W \leq 0.08$	$L \leq 3$	6	$0.08 < W$	$3 < L$	None
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$0.03 < W \leq 0.08$	$L \leq 3$	6																							
$0.08 < W$	$3 < L$	None																							
<p>2. Scratches(Glass, reflection plates, and polarizing plates)</p>	<p>In accordance with black spots. (At non lighting condition)</p>																								
<p>3. Color irregular</p>	<p>Not remarkable color irregular.</p>																								

4.	Air bubbles polarizing plates, and reflection plates	<table border="1" data-bbox="730 380 1248 667"> <tr> <th data-bbox="730 380 991 524">Average Diameter (mm): D</th> <th data-bbox="991 380 1248 524">Number of pieces permitted</th> <td data-bbox="1248 380 1495 667" rowspan="2">Average diameter = (Long diameter + Short diameter)/2</td> </tr> <tr> <td data-bbox="730 524 991 667">D ≤ 0.3 0.3 < D</td> <td data-bbox="991 524 1248 667">Ignore 0</td> </tr> </table> <p data-bbox="730 689 1495 779">Note that when there are 4 pieces or more, they are not to be concentrated.</p>	Average Diameter (mm): D	Number of pieces permitted	Average diameter = (Long diameter + Short diameter)/2	D ≤ 0.3 0.3 < D	Ignore 0					
Average Diameter (mm): D	Number of pieces permitted	Average diameter = (Long diameter + Short diameter)/2										
D ≤ 0.3 0.3 < D	Ignore 0											
5.	Cracks	<table border="1" data-bbox="683 779 1495 1964"> <tr> <td data-bbox="683 779 1086 1171"> <p data-bbox="683 779 1086 828">(1) General crack</p>  </td> <td data-bbox="1086 779 1495 1171"> <p data-bbox="1086 779 1495 1171"> $a \leq 5$ $b \leq 2$ $c \leq t$ Where, a and b are ignored when less than or equal 0.5. The numbers of pieces are set at up to 5 pieces. </p> </td> </tr> <tr> <td data-bbox="683 1171 1086 1361"> <p data-bbox="683 1171 1086 1220">(2) Corner crack</p>  </td> <td data-bbox="1086 1171 1495 1361"> <p data-bbox="1086 1171 1495 1361"> $a \leq 2.5$ $b \leq 2.5$ $c \leq t$ $a + b \leq 4$ </p> </td> </tr> <tr> <td data-bbox="683 1361 1086 1641"> <p data-bbox="683 1361 1086 1411">(3) Seal portion crack</p>  </td> <td data-bbox="1086 1361 1495 1641"> <p data-bbox="1086 1361 1495 1641"> $a \leq \text{The seal width} \times 1/3$ $b \leq t \times 2/3$ $c \leq 5$ The numbers of pieces are set at up to 5 pieces. </p> </td> </tr> <tr> <td data-bbox="683 1641 1086 1877"> <p data-bbox="683 1641 1086 1691">(4) ITO Pin crack</p>  </td> <td data-bbox="1086 1641 1495 1877"> <p data-bbox="1086 1641 1495 1877"> $a \leq 5$ $b \leq 1/3 \text{ pin length}$ $c \leq t$ </p> </td> </tr> <tr> <td data-bbox="683 1877 1086 1964"> <p data-bbox="683 1877 1086 1964">(5) Progressive cracks</p> </td> <td data-bbox="1086 1877 1495 1964"> <p data-bbox="1086 1877 1495 1964">All taken to be unacceptable.</p> </td> </tr> </table>	<p data-bbox="683 779 1086 828">(1) General crack</p> 	<p data-bbox="1086 779 1495 1171"> $a \leq 5$ $b \leq 2$ $c \leq t$ Where, a and b are ignored when less than or equal 0.5. The numbers of pieces are set at up to 5 pieces. </p>	<p data-bbox="683 1171 1086 1220">(2) Corner crack</p> 	<p data-bbox="1086 1171 1495 1361"> $a \leq 2.5$ $b \leq 2.5$ $c \leq t$ $a + b \leq 4$ </p>	<p data-bbox="683 1361 1086 1411">(3) Seal portion crack</p> 	<p data-bbox="1086 1361 1495 1641"> $a \leq \text{The seal width} \times 1/3$ $b \leq t \times 2/3$ $c \leq 5$ The numbers of pieces are set at up to 5 pieces. </p>	<p data-bbox="683 1641 1086 1691">(4) ITO Pin crack</p> 	<p data-bbox="1086 1641 1495 1877"> $a \leq 5$ $b \leq 1/3 \text{ pin length}$ $c \leq t$ </p>	<p data-bbox="683 1877 1086 1964">(5) Progressive cracks</p>	<p data-bbox="1086 1877 1495 1964">All taken to be unacceptable.</p>
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<p data-bbox="683 1877 1086 1964">(5) Progressive cracks</p>	<p data-bbox="1086 1877 1495 1964">All taken to be unacceptable.</p>											

6.	Outer dimensions	Should be with in the tolerance.
7.	Newton ring	Orbicular of interference fringes. To be non. In case of doubtful judgenemt, agreement shall be reachment.
8.	Soldering	Should be no defective soldering such as shorting, loose terminal cold solder, peeling of printed circuit board pattern, improper mouting position, etc.

5-3 Dot Appearance Defect

NO.	Item	Criteria
1.	Plinhole	 <p>Dot display a and b are each $\leq 0.2\text{mm}$ The overall total is taken be with in 10 units. Note that they are not to be concentrated.</p>
2.	Missing	 <p>Dot display a and b are each $\leq 0.2\text{mm}$ The overall total is taken to be with in 10 units.</p>
3.	Thick and thin display	 <p>Taken to be within $\pm 1.5\%$ of display character width(a) and height(b).</p>

NOTE:

• SAFETY

- 1.If the LCD panel breaks, be careful not to get the liquid crystal to touch your skin.
- 2.If the liquid crystal touches your skin or clothes, please wash it off immediately by using soap and water.

• HANDLING

- 1.Avoid static electricity which can damage the CMOS LSI.
- 2.Do not remove the panel or frame from the module.
- 3.The polarizing plate of the display is very fragile. So, please handle it very carefully.
- 4.Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- 5.Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.

• STORAGE

- 1.Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$ and the humidity is below 65% RH.
- 2.Do not place the module near organics solvents or corrosive gases.
- 3.Do not crush, shake, or jolt the module.

• TERMS OF WARRANT

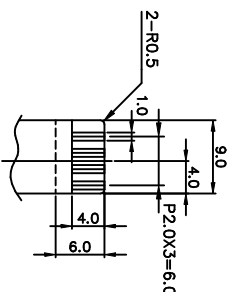
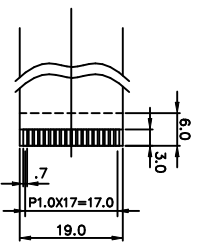
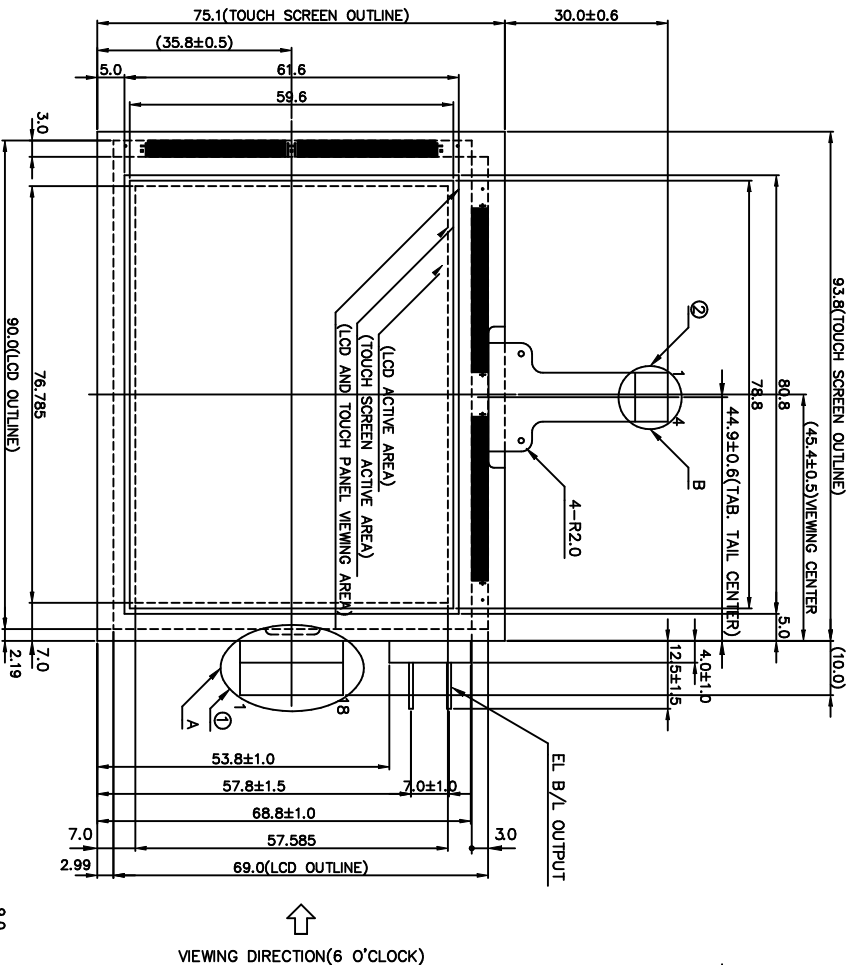
- 1.Acceptance inspection period
The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- 2.Applicable warrant period
The period is within twelve months since the date of shipping out under normal using and storage conditions.

• THE SHELF LIFE TIME OF BACK LIGHT

- EL : 2,000HR at AC 65 Vrms 250 Hz 20°C 60% RH
(Operating life time is defined as follows :
The final brightness is at 50% of original brightness)

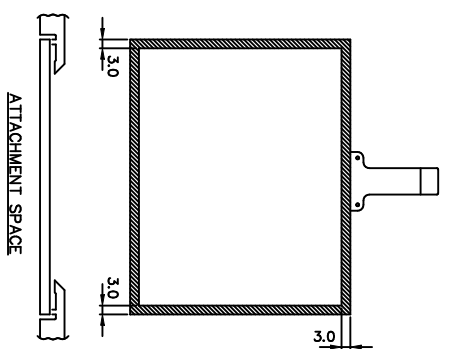
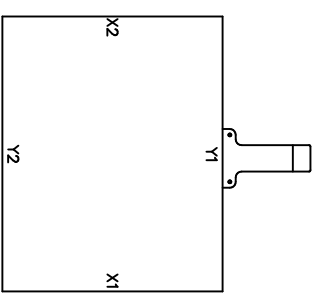
Pin No.	Symbol	Pin No.	Symbol
1	V5	10	/D.OFF
2	V2	11	CP
3	VEE	12	V4
4	VDD	13	V3
5	FRM	14	D3
6	VGND	15	D2
7	LOAD	16	D1
8	VSS	17	D0
9	DF	18	NC

① I/O CONNECTION



② TOUCH PANEL CONNECTION

No.	Symbol
1	Y2
2	X2
3	Y1
4	X1



GENERAL TOLERANCE LIST

DIMENSION	TOLERANCE
L ≤ 6	±0.25 (mm)
6 < L ≤ 18	±0.3 (mm)
18 < L ≤ 50	±0.4 (mm)
50 < L ≤ 125	±0.5 (mm)
125 < L	±0.6 (mm)
ANGLE	±1° (DEG)

DOIS DETAIL

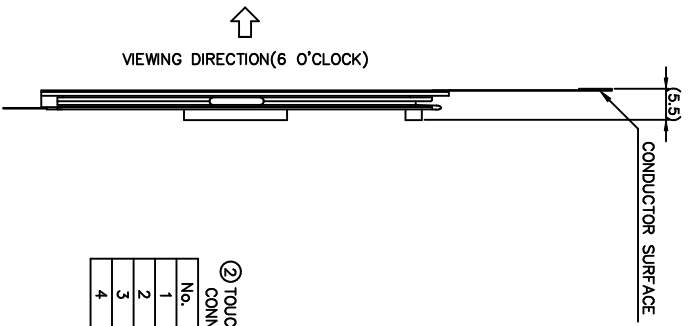
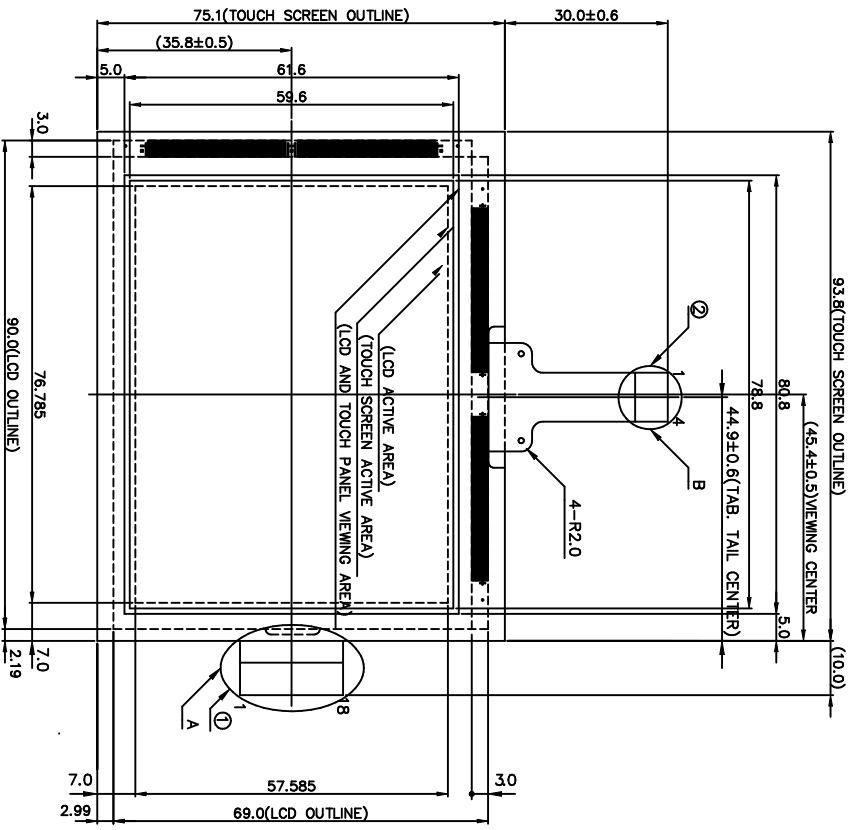
REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE
1					
2					
3					
4					

APPROVE	CHECK	DESIGN	DRAWN	DWG. NO.	DATE	SCALE	UNIT
				M202-D11A	89.05.24	1/1	mm

南亞塑膠工業股份有限公司
 NAN YA PLASTICS CORPORATION
 製品圖
 LTD79X202X1K
 LTD79X202X1GK

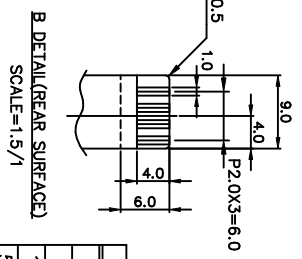
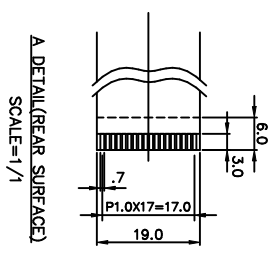
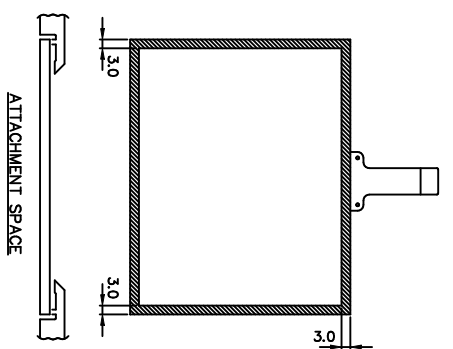
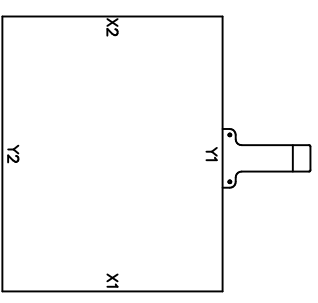
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① I/O CONNECTION



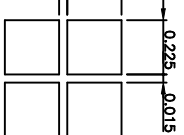
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125 < L	±0.6 (mm)
ANGLE	±1° (DEG)



南亞塑膠工業股份有限公司
NAN YA PLASTICS CORPORATION

製品圖
LT179X202X1K

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE	DWG. NO.
1						M202AD11A