

NAN YA PLASTICS CORPORATION

SPECIFICATION OF
LCD MODULE
PRODUCT NO.: LDA75_279__

SPEC. NO.: LT279-0- \triangle 1

CUSTOMER
APPROVED BY
DATE:

LCD DEPARTMENT
ELECTRONIC MATERIALS DIVISION
NAN YA PLASTICS CORPORATION
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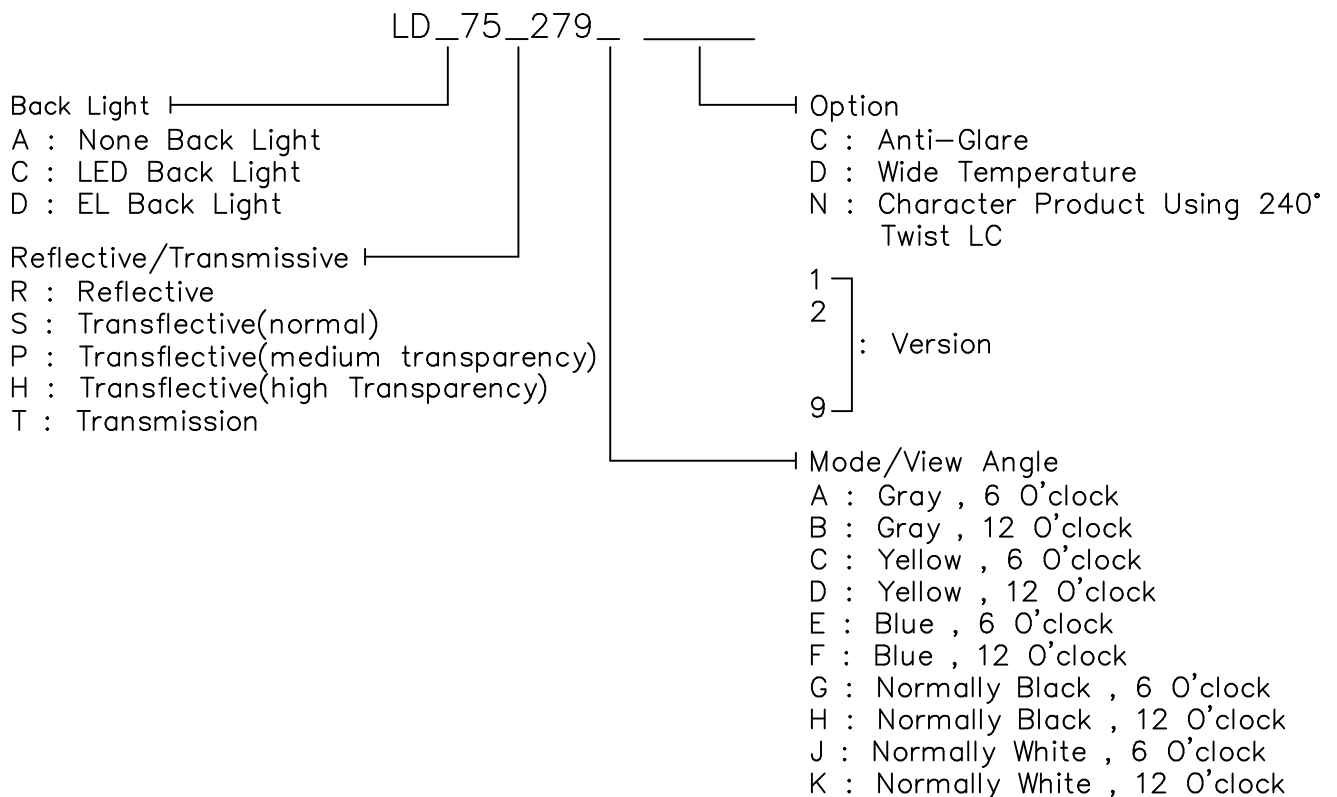
EDITED NO. : MAY, 12, 2000

DESIGN MANAGER	DESIGN CHECK	DESIGNER
		J.Y. Lin

1. MECHANICAL DATA

(1) Product No.	LDA75_279_ _____
(2) Module Size	77.5 (W)mm x 51.3 (H)mm x MAX2.8 (D)mm (W/O B.L.)
(3) Dot Size	0.48 (W)mm x 0.48 (H)mm
(4) Dot Pitch	0.52 (W)mm x 0.52 (H)mm
(5) Number of Characters	128 (W) x 64 (H)
(6) Duty	1/64
(9) LCD Display Mode	STN: <input type="checkbox"/> Gray Mode <input type="checkbox"/> Yellow Mode <input type="checkbox"/> Blue Mode FSTN: <input type="checkbox"/> Black and White(Normal White/Positive Image) <input type="checkbox"/> Black and White(Normal Black/Negative Image) Rear Polarizer: <input type="checkbox"/> Reflective
(10) Viewing Direction	<input type="checkbox"/> 6 O'clock <input type="checkbox"/> 12 O'clock <input type="checkbox"/> ____O'clock
(11) Backlight	W/O
(12) Weight	23.0 g (approx)
(13) Controller (COG)	SED1565

Note :



REV/DATE	R0/ 03.23.99'	R1/ 05.12.00'				BY J.Y. Lin
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2. ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

VSS=0V

	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	-0.3	5.5	V	
Input Voltage	VI	-0.3	VDD	V	
Static Electricity	-	-	-	-	Note 1

Note 1 LCM should be grounded during handling LCM.

(2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	NORMAL TEMP.				WIDE TEMP.			
	OPERATING		STORAGE		OPERATING		STORAGE	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	0	50	-20	70	-20	70	-30	80
Humidity (Without Condensation)	Note 2,4		Note 3,4		Note 4,5		Note 4,6	

Note 2 Ta \leq 50°C : 85%RH max
Ta > 50°C : Absolute humidity must be lower
than the humidity of 85%RH at 50°C

Note 3 Ta at -20°C will be < 48hrs, at 70°C will be < 120hrs

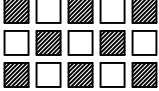
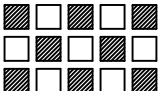
Note 4 Background color will change slightly depending on ambient temperature.
at phenomenon is reversible.

Note 5 Ta \leq 70°C : 75%RH max
Ta > 70°C : Absolute humidity must be lower
than the humidity of 75%RH at 70°C

Note 6 Ta at -30°C will be < 48hrs, at 80°C will be < 120hrs

3. ELECTRICAL CHARACTERISTICS

(VDD= 3V/5V ± 10%)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Input Voltage	VIH	H level	0.8VDD	-	VDD	V	
	VIL	L level	0	-	0.2VDD		
Recommended LCD Driving Voltage (WIDE TEMP. LCM)	VDD-V5 (VLCD)	DUTY= 1/64 Bias= 1/9	-20°C	10.6	11.0	11.4	V
			0°C	9.1	9.5	9.9	
			25°C	8.8	9.2	9.6	
			50°C	8.5	8.9	9.3	
			70°C	8.6	9.0	9.4	
Power Supply Current (VDD = 5V)	IDD	FLM = 70Hz VDD = 5.0V VDD-V5 = 9.2V 	-	0.7	1.1	mA	
Power Supply Current (VDD = 3V)	IDD	FLM = 70Hz VDD = 3.0V VDD-V5 = 9.2V 	-	1.6	2.4	mA	

4-1. OPTICAL CHARACTERISTICS

(FOR NORMAL TEMPERATURE MODE LCM)

AT V_{OP}

ITEM MODE		Cr(Contrast Ratio)		θ (Viewing Angle)		ϕ (Viewing Angle)	
		25℃		25℃		25℃	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
R	A	-	3.5	-	43	-	49
	C	-	6.0	-	67	-	66
	J	-	5.5	-	70	-	65
S	A	-	-	-	-	-	-
	C	-	-	-	-	-	-
	J	-	6.0	-	63	-	69
NOTE		NOTE 6		NOTE 5			

NOTE :

R: REFLECTIVE
S: TRANSFLECTIVE
T: TRANSMISSIVE
A/B: GRAY

C/D: YELLOW
E/F: BLUE
G/H: NORMALLY BLACK
J/K: NORMALLY WHITE

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

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	0℃	-	1400	2100	ms	NOTE 2
		25℃	-	350	550		
		50℃	-	160	240		
Response Time (fall)	Tf	0℃	-	700	1100	ms	NOTE 2
		25℃	-	180	270		
		50℃	-	80	120		

4-2. OPTICAL CHARACTERISTICS

(FOR WIDE TEMPERATURE MODE LCM)

AT Vop

MODE	ITEM	Cr(Contrast Ratio)										θ (Viewing Angle)		ϕ (Viewing Angle)	
		-20℃		0℃		25℃		50℃		70℃		25℃		25℃	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
R	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	J	-	3.7	-	4.0	-	5.7	-	5.8	-	4.7	-	70	-	65
S	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	J	-	3.6	-	5.2	-	6.1	-	4.9	-	3.7	-	63	-	69
T	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	G	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NOTE		NOTE 6										NOTE 5			

NOTE :

R: REFLECTIVE
S: TRANSFLECTIVE
T: TRANSMISSIVE
A/B: GRAY

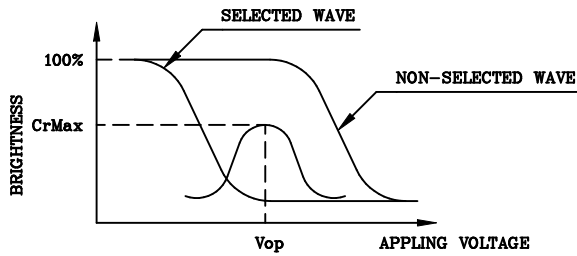
C/D: YELLOW
E/F: BLUE
G/H: NORMALLY BLACK
J/K: NORMALLY WHITE

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

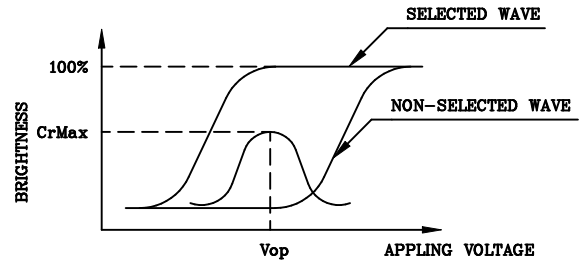
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	-20℃	-	11240	-	ms	NOTE 2
		0℃	-	1450	-		
		25℃	-	350	-		
		50℃	-	145	-		
		70℃	-	75	-		
Response Time (fall)	Tf	-20℃	-	6200	-	ms	NOTE 2
		0℃	-	700	-		
		25℃	-	160	-		
		50℃	-	70	-		
		70℃	-	70	-		

(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



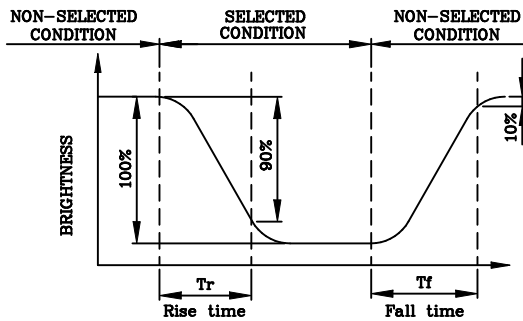
(negative type)

*Conditions

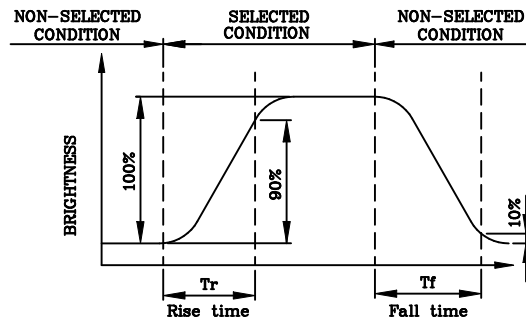
Viewing Angle : 0
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



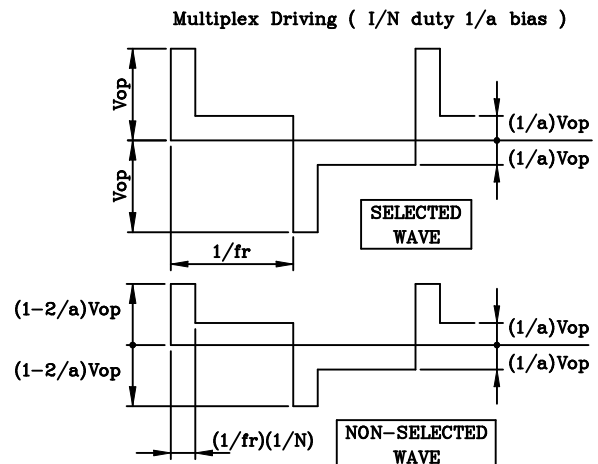
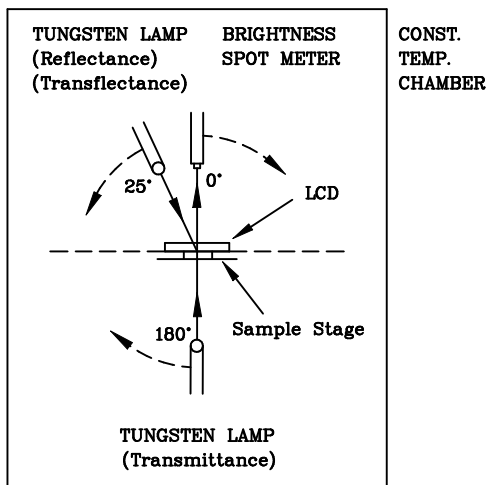
(negative type)

*Conditions

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

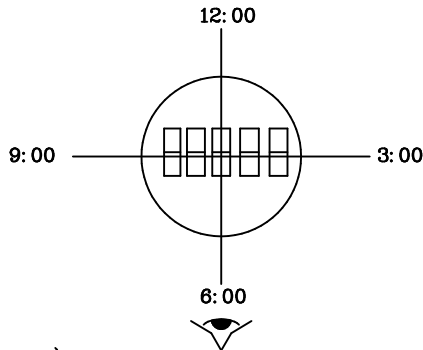
(NOTE 3)

Description of Measuring Equipment and Driving Waveforms



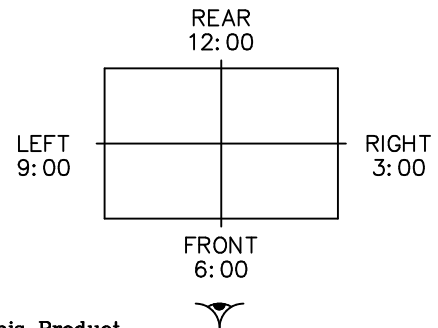
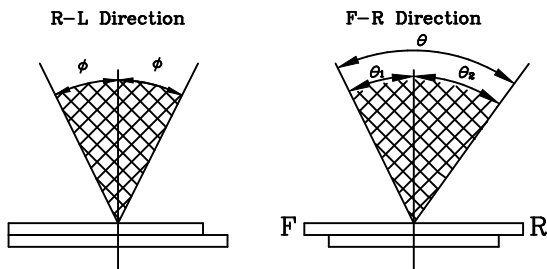
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



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

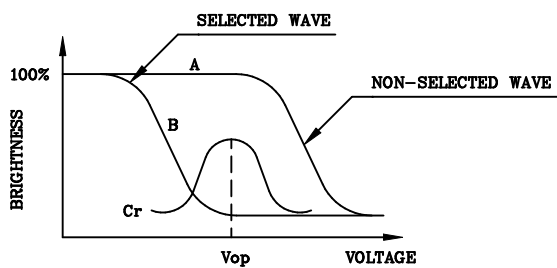
$$\theta = \theta_1 + \theta_2$$

*Conditions

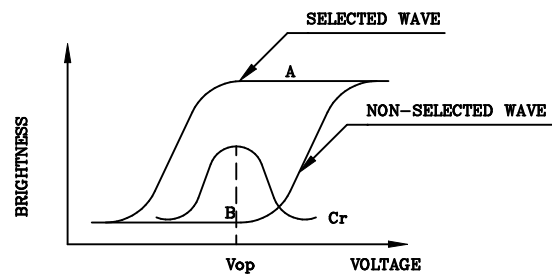
Operating Voltage : V_{op}
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias
 Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



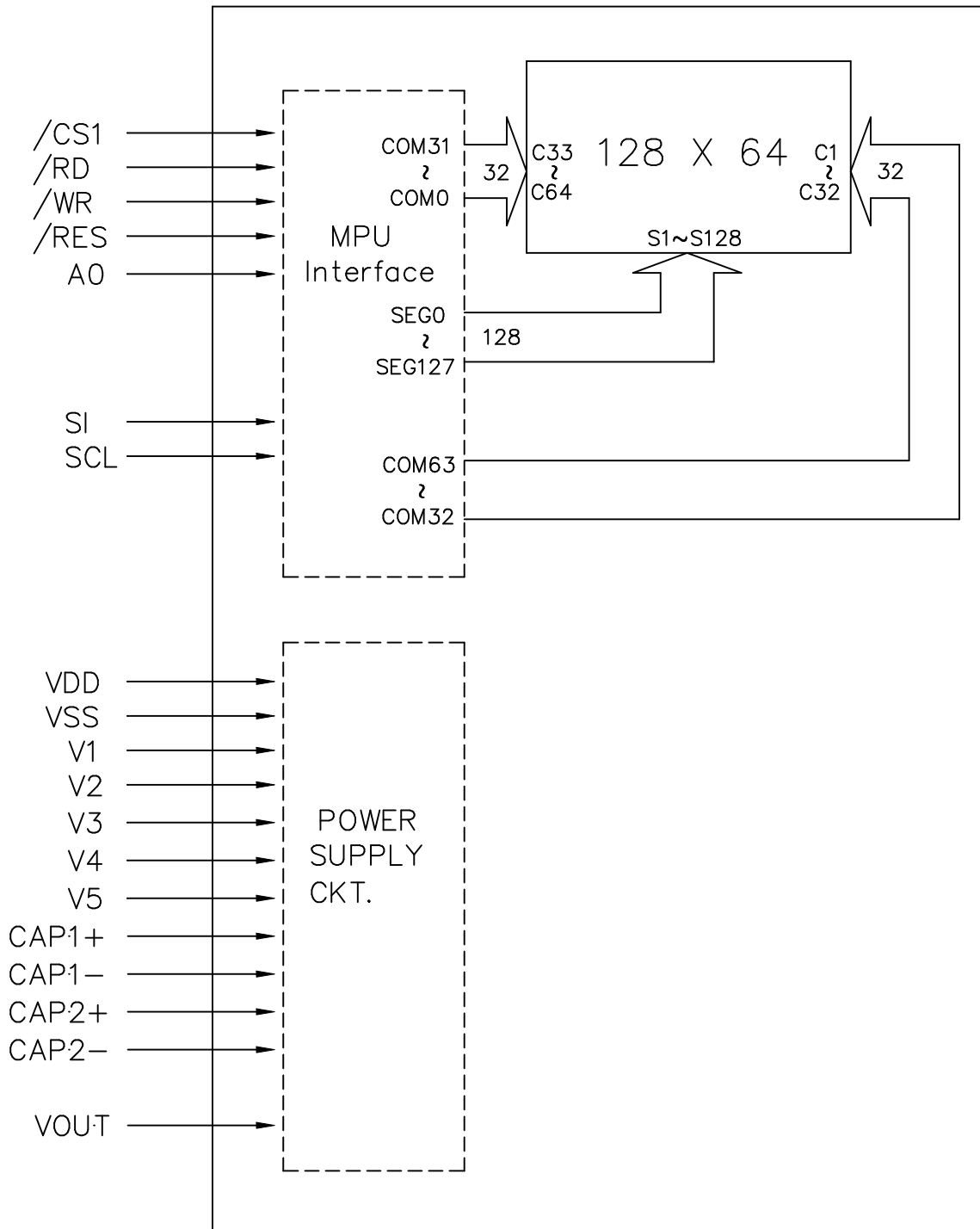
(negative type)

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

*Conditions

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

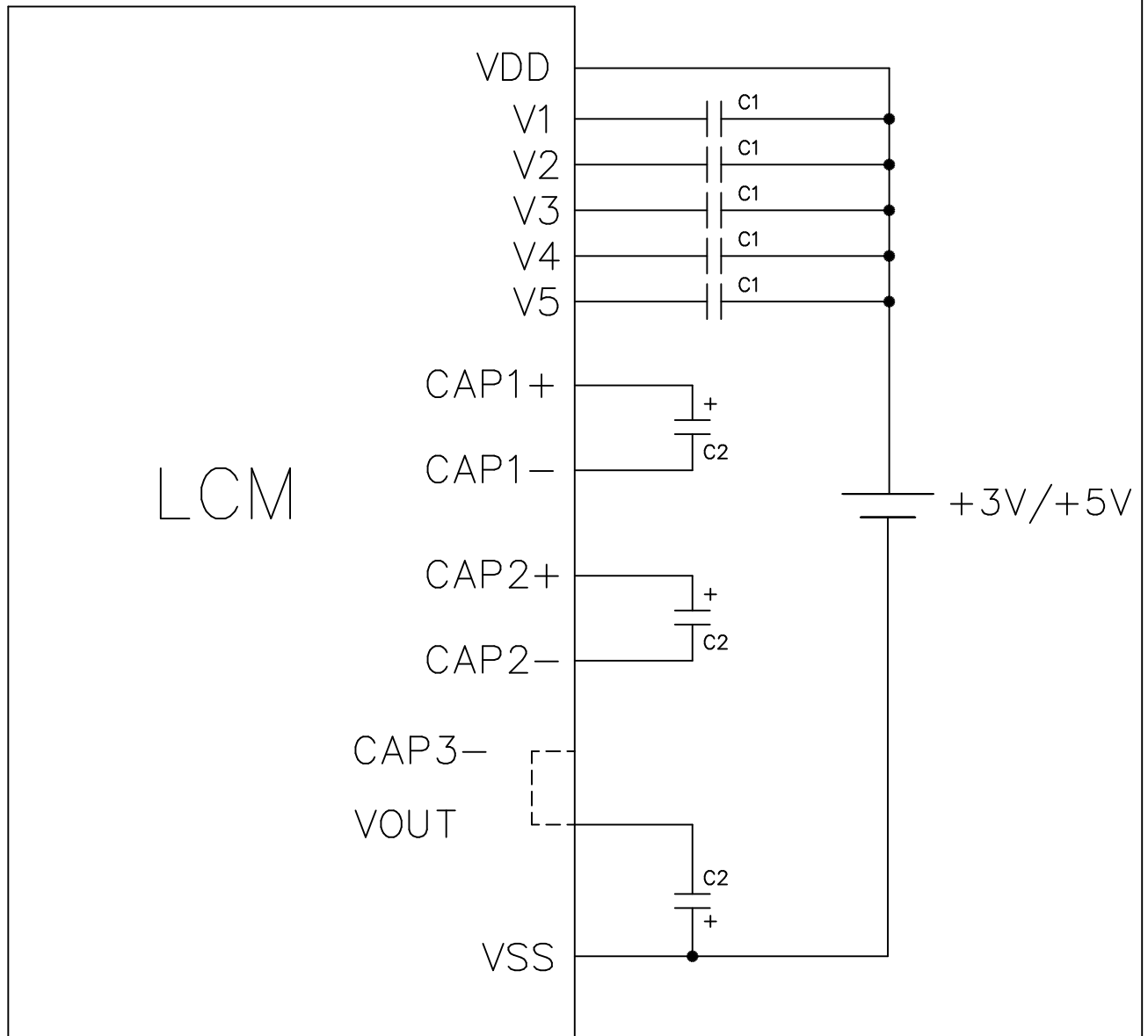
5. MPU INTERFACE/BLOCK DIAGRAM



6. INTERNAL PIN CONNECTION

Pin No.	Symbol	Function
1	V5	This is a multi-level power supply for the liquid crystal drive. $VDD(=V0) \cong V1 \cong V2 \cong V3 \cong V4 \cong V5$
2	V4	
3	V3	
4	V2	
5	V1	
6	N.C	N.C
7	CAP2+	Connect a capacitor between this terminal and the CAP2- terminal.
8	CAP2-	Connect a capacitor between this terminal and the CAP2+ terminal.
9	CAP1-	Connect a capacitor between this terminal and the CAP1+ terminal.
10	CAP1+	Connect a capacitor between this terminal and the CAP1- terminal.
11	VOUT	Connect a capacitor between this terminal and the VSS
12	VSS	0V(GND)
13	VDD	+3V/+5.0V(Logic voltage)
14	D7(SI)	Serial data input
15	D6(SCL)	Serial clock input
16	/RD	Fixed to either "H" or to "L"
17	/WR	Fixed to either "H" or to "L"
18	A0	"H"=Display data , "L"=Control data
19	/RES	Reset signal
20	/CS1	Chip select signal

7. POWER SUPPLY/BOOSTER CAPACITANCE



C1: 2.2~4.7 μ F

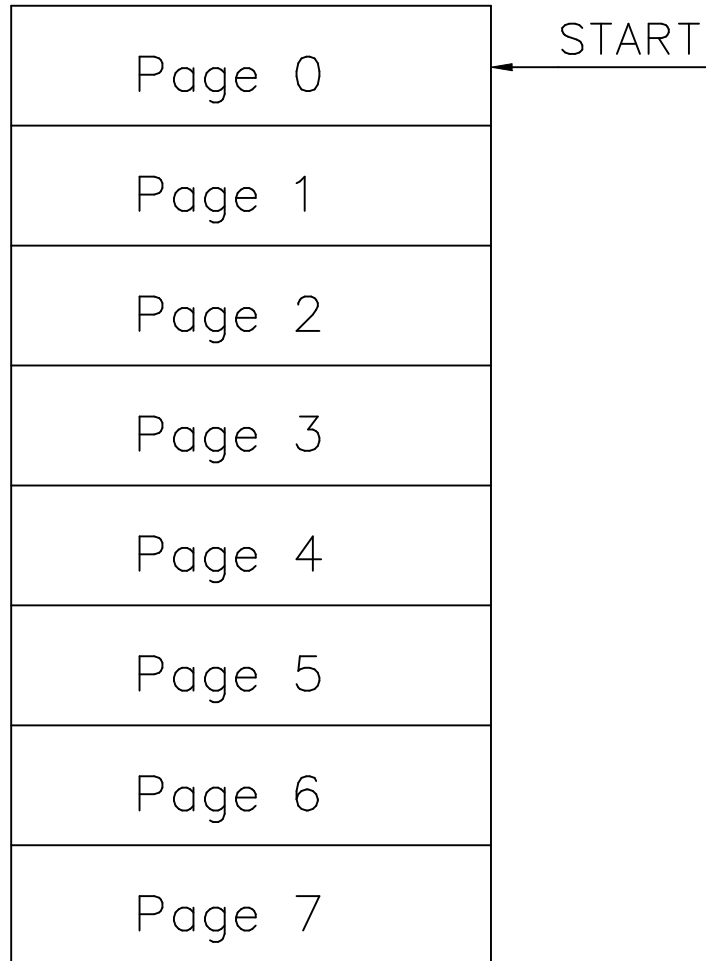
C2: 2.2~4.7 μ F

8-1.SED1565 Series Commands

Command	Command Code										Function	
	A0	\overline{RD}	\overline{WR}	D7	D6	D5	D4	D3	D2	D1		D0
(1)Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0	LCD display ON/OFF 0: OFF,1: ON
(2)Display start line set	0	1	0	0	1	Display start address					1	Sets the display RAM display start line address
(3)Page address set	0	1	0	1	0	1	Page address					Sets the display RAM page address
(4)Column address set upper bit	0	1	0	0	0	0	1	Most significant column address				Sets the most significant 4 bits of the display RAM column address.
Column address set lower bit	0	1	0	0	0	0	0	Least significant column address				Sets the least significant 4 bits of the display RAM column address.
(5)Status read	0	0	1	Status				0	0	0	0	Reads the status data
(6)Display data write	1	1	0	Write data							0	Writes to the display RAM
(7)Display data read	1	0	1	Read data							0	Reads from the display RAM
(8)ADC select	0	1	0	1	0	1	0	0	0	0	1	Sets the display RAM address SEG output correspondence 0: normal,1: reverse
(9)Display normal/reverse	0	1	0	1	0	1	0	0	1	1	0	Sets the LCD display normal/reverse 0: normal,1: reverse
(10)Display all points ON/OFF	0	1	0	1	0	1	0	0	1	0	0	Display all points 0: normal display 1: all point ON
(11)LCD bias set	0	1	0	1	0	1	0	0	0	1	0	Sets the LCD drive voltage bias ratio SED1565***...0:1/9,1:1/7 SED1566***...0:1/8,1:1/6 SED1567***...0:1/6,1:1/5
(12)Read/modify/write	0	1	0	1	1	1	0	0	0	0	0	Column address increment At write: +1 At read: 0
(13)End	0	1	0	1	1	1	0	1	1	1	0	Clear read/modify/write
(14)Reset	0	1	0	1	1	1	0	0	0	1	0	Internal reset
(15)Common output mode select	0	1	0	1	1	0	0	0	*	*	*	Select COM output scan direction 0: normal direction, 1: reverse direction
(16)Power control set	0	1	0	0	0	1	0	1	Operating mode		0	Select internal power supply operating mode
(17)V5 voltage regulator internal resistor ratio set	0	1	0	0	0	1	0	0	Resistor ratio		0	Select internal resistor ratio (Rb/Ra) mode
(18)Electronic volume mode set	0	1	0	1	0	0	0	0	0	0	1	Set the V5 output voltage electronic volume register
Electronic volume register set	0	1	0	*	*	Electronic volume value						
(19)Static indicator ON/OFF	0	1	0	1	0	1	0	1	1	0	0	0: OFF,1: ON
Static indicator register set	0	1	0	*	*	*	*	*	*	*	mode	Set the flashing mode
(20)Power saver												Display OFF and display all points ON compound command
(21)NOP	0	1	0	1	1	1	0	0	0	1	1	Command for non-operation
(22)Test	0	1	0	1	1	1	1	*	*	*	*	Command for IC test. Do not use this command
(23)Test mode reset	0	1	0	1	1	1	1	0	0	0	0	Enter during the refresh sequence.

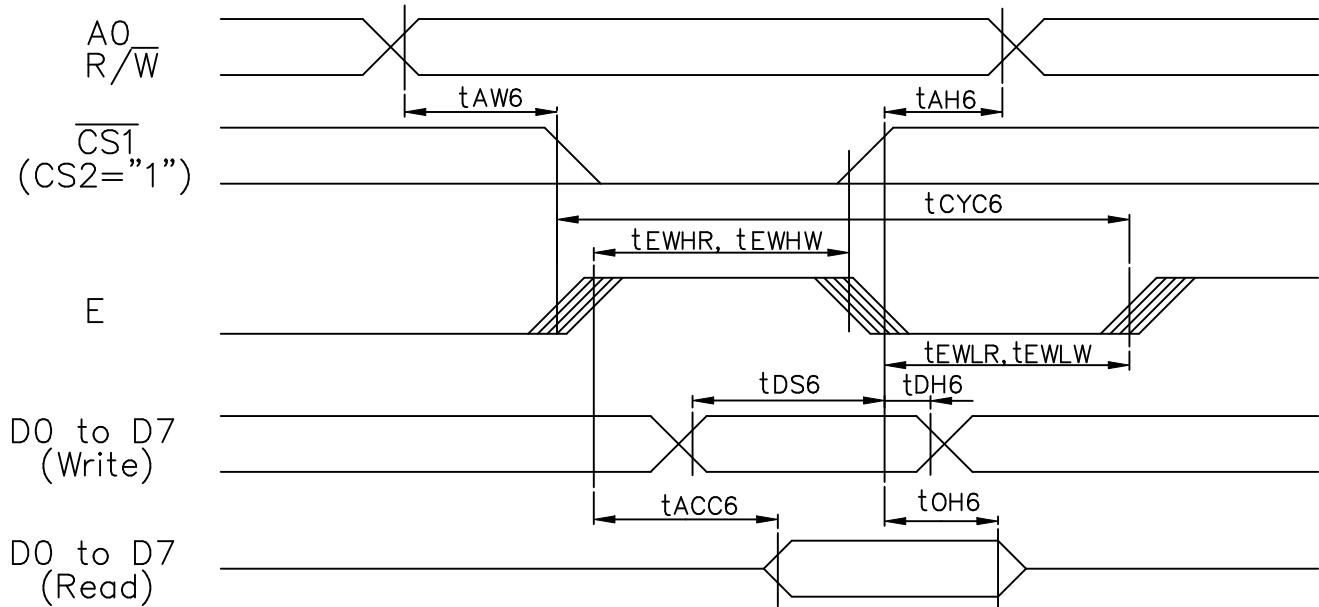
(Note)*: disabled data

8-3. DISPLAY PATTRN



9-1. TIMING CHARACTERISTICS

(For 6800 Series MPU)



VDD=4.5~5.5V, Ta=-40~85°C

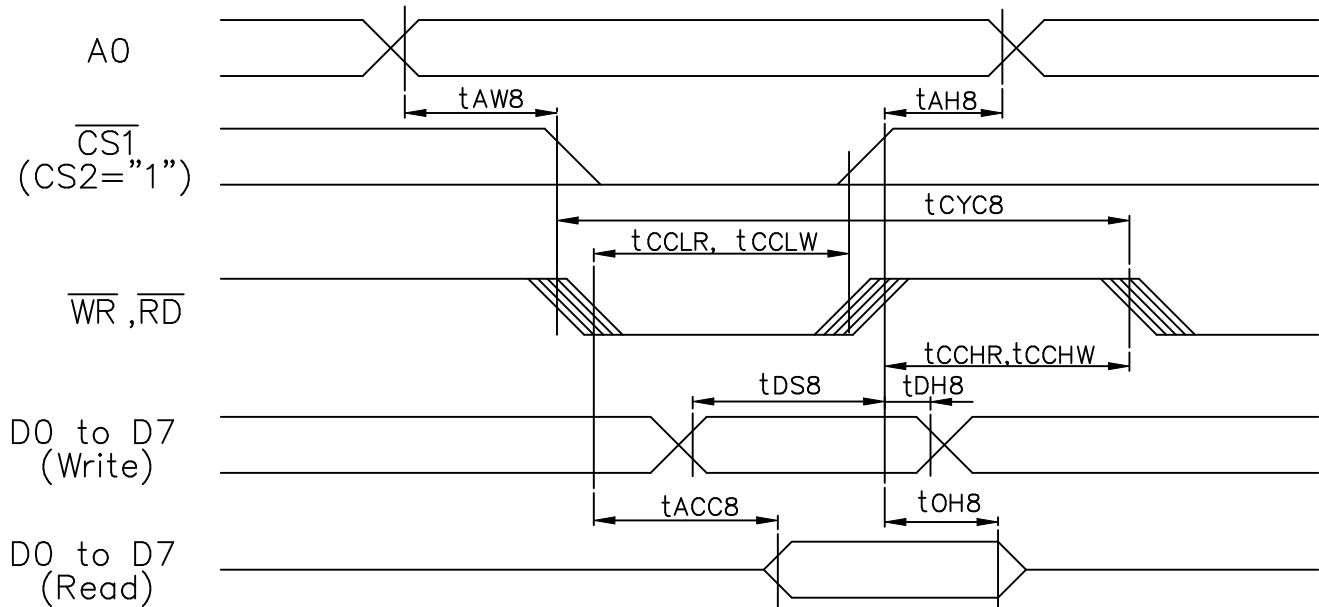
Item	Signal	Symbol	Condition	Rating		Unites
				Min	Max	
Address hold time	A0	t_{AH6}		0	-	ns
Address setup time	A0	t_{AW6}		0	-	ns
System cycle time	A0	t_{CYC6}		166	-	ns
Data setup time	D0 to D7	t_{DS6}		30	-	ns
Data hold time		t_{DH6}		10	-	ns
Access time	D0 to D7	t_{ACC6}	CL=100pF	-	70	ns
Output disable time		t_{OH6}		10	50	ns
Enable H pulse time	Read Write	E	t_{EWHR} t_{EHWL}	70	-	ns
				30	-	ns
Enable L pulse time	Read Write	E	t_{EHLR} t_{EHLW}	30	-	ns
				30	-	ns

VDD=2.7~4.5V, Ta=-40~85°C

Item	Signal	Symbol	Condition	Rating		Unites
				Min	Max	
Address hold time	A0	t_{AH6}		0	-	ns
Address setup time	A0	t_{AW6}		0	-	ns
System cycle time	A0	t_{CYC6}		300	-	ns
Data setup time	D0 to D7	t_{DS6}		40	-	ns
Data hold time		t_{DH6}		15	-	ns
Access time	D0 to D7	t_{ACC6}	CL=100pF	-	140	ns
Output disable time		t_{OH6}		10	100	ns
Enable H pulse time	Read Write	E	t_{EWHR} t_{EHWL}	120	-	ns
				60	-	ns
Enable L pulse time	Read Write	E	t_{EHLR} t_{EHLW}	60	-	ns
				60	-	ns

9-2. TIMING CHARACTERISTICS

(For 8080 Series MPU)



VDD=4.5~5.5V, Ta=-40~85°C

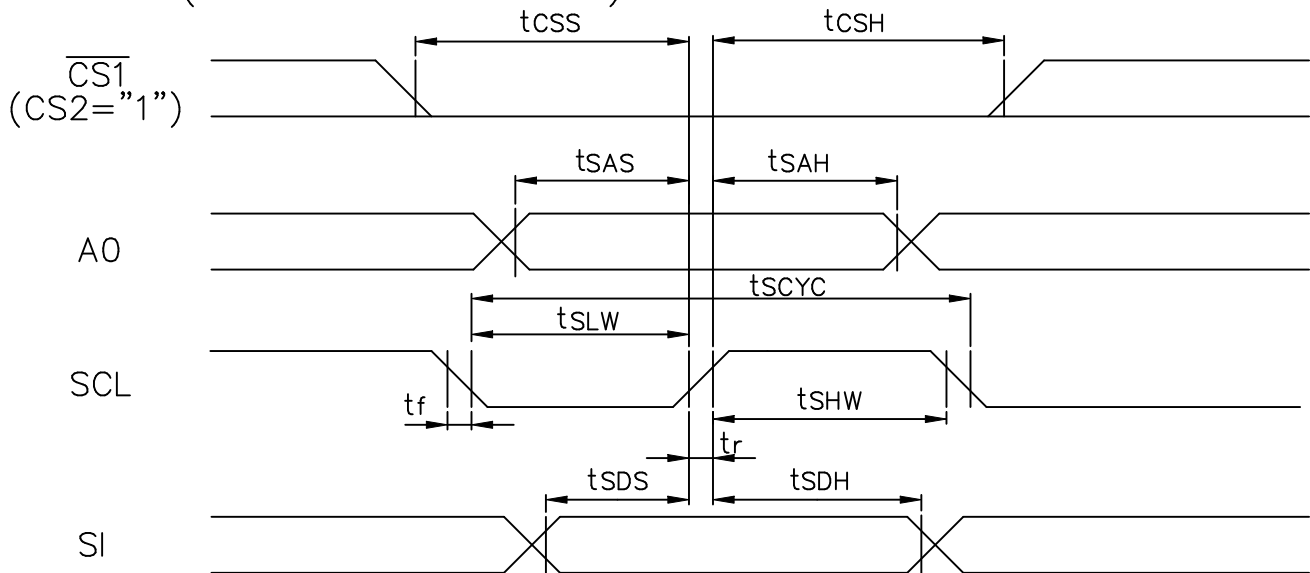
Item	Signal	Symbol	Condition	Rating		Unites
				Min	Max	
Address hold time	A0	tAH8		0	-	ns
Address setup time	A0	tAW8		0	-	ns
System cycle time	A0	tCYC8		166	-	ns
Control L pulse width	WR	tCCLW		30	-	ns
Control L pulse width	RD	tCCLR		70	-	ns
Control H pulse width	WR	tCCHW		30	-	ns
Control H pulse width	RD	tCCHR		30	-	ns
Data setup time	D0 to D7	tDS8		30	-	ns
Data hold time		tDH8		10	-	ns
RD access time	D0 to D7	tACC8	CL=100pF	-	70	ns
Output disable time		tOH8		5	50	ns

VDD=2.7~4.5V, Ta=-40~85°C

Item	Signal	Symbol	Condition	Rating		Unites
				Min	Max	
Address hold time	A0	tAH8		0	-	ns
Address setup time	A0	tAW8		0	-	ns
System cycle time	A0	tCYC8		300	-	ns
Control L pulse width	WR	tCCLW		60	-	ns
Control L pulse width	RD	tCCLR		120	-	ns
Control H pulse width	WR	tCCHW		60	-	ns
Control H pulse width	RD	tCCHR		60	-	ns
Data setup time	D0 to D7	tDS8		40	-	ns
Data hold time		tDH8		15	-	ns
RD access time	D0 to D7	tACC8	CL=100pF	-	140	ns
Output disable time		tOH8		10	100	ns

9-3. TIMING CHARACTERISTICS

(For Series Interface)



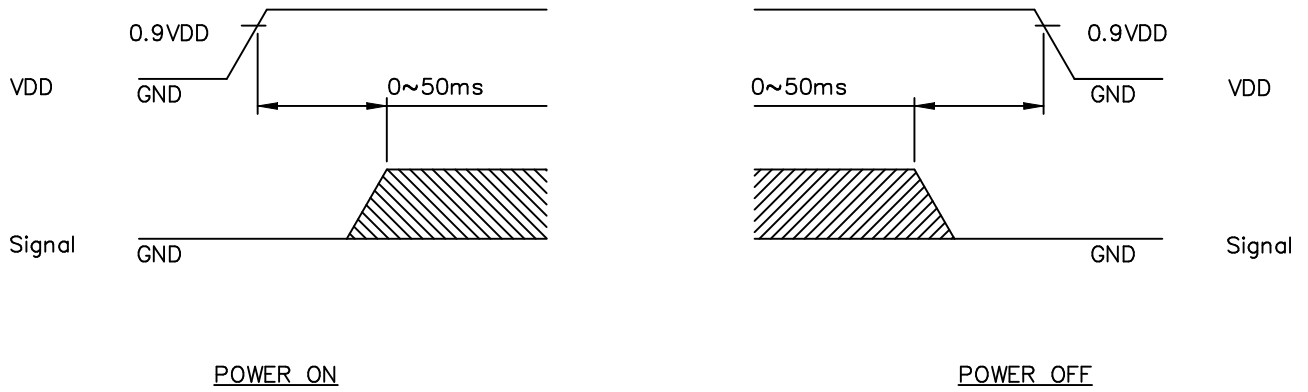
VDD=4.5~5.5V, Ta=-40~85°C

Item	Signal	Symbol	Condition	Rating		Unites
				Min	Max	
Serial Clock Period		tSCYC		200	-	ns
SCL "H" pulse width	SCL	tSHW		75	-	ns
SCL "L" pulse width	SCL	tSLW		75	-	ns
Address setup time	A0	tSAS		50	-	ns
Address hold time	A0	tSAH		100	-	ns
Data setup time	SI	tSDS		50	-	ns
Data hold time	SI	tSDH		50	-	ns
CS-SCL time	CS	tCSS		100	-	ns
		tCSH		100	-	ns

VDD=2.7~4.5V, Ta=-40~85°C

Item	Signal	Symbol	Condition	Rating		Unites
				Min	Max	
Serial Clock Period		tSCYC		250	-	ns
SCL "H" pulse width	SCL	tSHW		100	-	ns
SCL "L" pulse width	SCL	tSLW		100	-	ns
Address setup time	A0	tSAS		150	-	ns
Address hold time	A0	tSAH		150	-	ns
Data setup time	SI	tSDS		100	-	ns
Data hold time	SI	tSDH		100	-	ns
CS-SCL time	CS	tCSS		150	-	ns
		tCSH		150	-	ns

9-4. POWER ON/OFF TIMING



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

10. 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

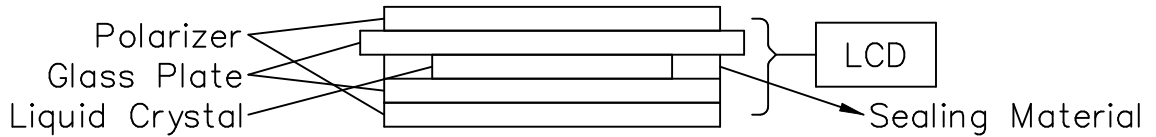
The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

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

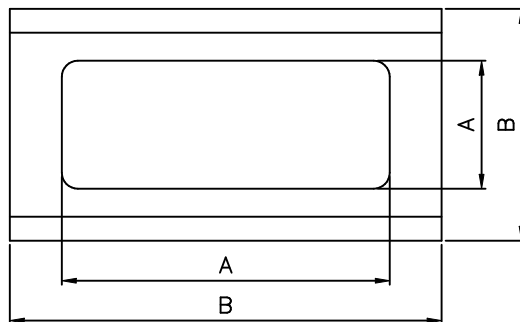
	Item		AQL(%)	Remarks
Major Defect	Dots	Opens Shorts Erroneous operation	0.4	faults which substantially lower the practicality and the initial purpose difficult to achieve.
	Solder appearance	Shorts Loose		
	Cracks	Display surface cracks		

	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

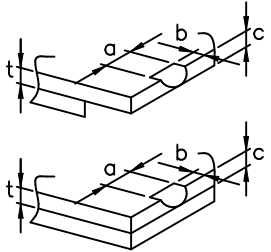
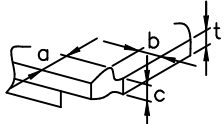
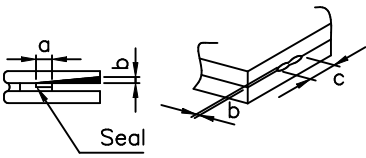
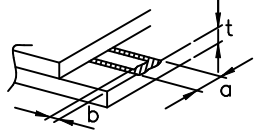
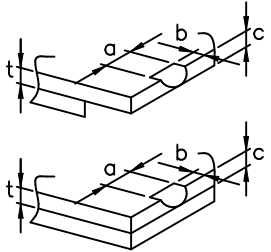
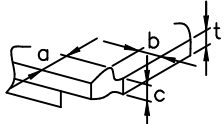
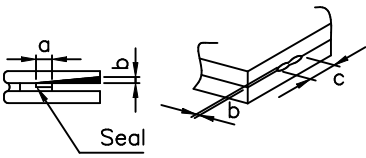
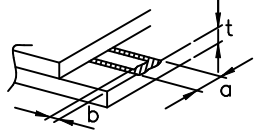
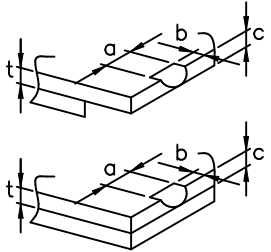
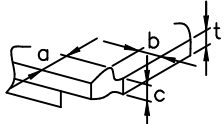
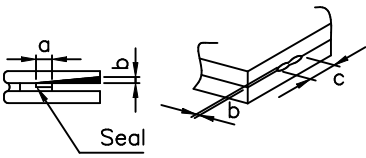
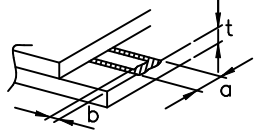
NO.	Item	Criterion
1.	Non operational	Fail
2.	Miss operating	Fail
3.	Missing dot	Fail
4.	Contrast irregular	Not allowable
5.	Response time	Within Specified value

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 data-bbox="730 477 1054 573">Average Diameter(mm):D</th> <th data-bbox="1054 477 1377 573">Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td data-bbox="730 573 1054 622">D ≤ 0.1</td> <td data-bbox="1054 573 1377 622">Ignore</td> </tr> <tr> <td data-bbox="730 622 1054 672">0.1 < D ≤ 0.2</td> <td data-bbox="1054 622 1377 672">5</td> </tr> <tr> <td data-bbox="730 672 1054 721">0.2 < D ≤ 0.3</td> <td data-bbox="1054 672 1377 721">2</td> </tr> <tr> <td data-bbox="730 721 1054 763">0.3 < D</td> <td data-bbox="1054 721 1377 763">0</td> </tr> </tbody> </table> <p data-bbox="730 772 1337 857">Number of total pieces is set to within 5 pieces.</p> <p data-bbox="730 891 1453 1064">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 data-bbox="730 1189 1054 1285">Average Diameter(mm):D</th> <th data-bbox="1054 1189 1377 1285">Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td data-bbox="730 1285 1054 1335">D ≤ 0.3</td> <td data-bbox="1054 1285 1377 1335">Ignore</td> </tr> <tr> <td data-bbox="730 1335 1054 1384">0.3 < D ≤ 0.75</td> <td data-bbox="1054 1335 1377 1384">5</td> </tr> <tr> <td data-bbox="730 1384 1054 1429">0.75 < D</td> <td data-bbox="1054 1384 1377 1429">0</td> </tr> </tbody> </table> <p data-bbox="730 1438 1337 1523">Number of total pieces is set to within 5 pieces.</p> <p data-bbox="730 1556 1453 1729">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 ≤ 0.1	Ignore	0.1 < D ≤ 0.2	5	0.2 < D ≤ 0.3	2	0.3 < D	0	Average Diameter(mm):D	Number of pieces permitted	D ≤ 0.3	Ignore	0.3 < D ≤ 0.75	5	0.75 < D	0
Average Diameter(mm):D	Number of pieces permitted																			
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0.1 < D ≤ 0.2	5																			
0.2 < D ≤ 0.3	2																			
0.3 < D	0																			
Average Diameter(mm):D	Number of pieces permitted																			
D ≤ 0.3	Ignore																			
0.3 < D ≤ 0.75	5																			
0.75 < D	0																			

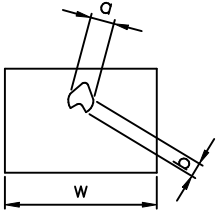
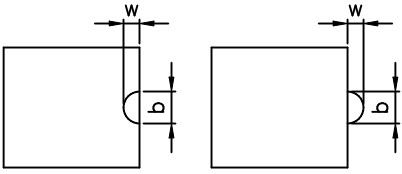
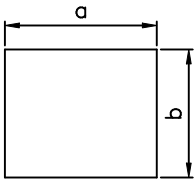
SPECIFICATION

<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 1474 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 1474 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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$W \leq 0.03$	Ignore	Ignore																							
$0.03 < W \leq 0.08$	$L \leq 3$	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>																								

<p>4. Air bubbles polarizing plates, and reflection plates</p>	<table border="1" data-bbox="730 376 1248 667"> <tr> <th data-bbox="730 376 991 521">Average Diameter (mm): D</th> <th data-bbox="991 376 1248 521">Number of pieces permitted</th> </tr> <tr> <td data-bbox="730 521 991 566">$D \leq 0.3$</td> <td data-bbox="991 521 1248 566">Ignore</td> </tr> <tr> <td data-bbox="730 566 991 667">$0.3 < D$</td> <td data-bbox="991 566 1248 667">0</td> </tr> </table> <p data-bbox="1248 376 1498 667">Average diameter = (Long diameter + Short diameter)/2</p> <p data-bbox="730 683 1498 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	$D \leq 0.3$	Ignore	$0.3 < D$	0					
Average Diameter (mm): D	Number of pieces permitted												
$D \leq 0.3$	Ignore												
$0.3 < D$	0												
<p>5. Cracks</p>	<table border="1" data-bbox="683 779 1498 1964"> <tr> <td data-bbox="683 779 1086 1171"> <p>(1) General crack</p>  </td> <td data-bbox="1086 779 1498 1171"> <p>$a \leq 5$ $b \leq 2$ $c \leq t$</p> <p>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>(2) Corner crack</p>  </td> <td data-bbox="1086 1171 1498 1361"> <p>$a \leq 2.5$ $b \leq 2.5$ $c \leq t$ $a + b \leq 4$</p> </td> </tr> <tr> <td data-bbox="683 1361 1086 1641"> <p>(3) Seal portion crack</p>  </td> <td data-bbox="1086 1361 1498 1641"> <p>$a \leq \text{The seal width} \times 1/3$ $b \leq t \times 2/3$ $c \leq 5$</p> <p>The numbers of pieces are set at up to 5 pieces.</p> </td> </tr> <tr> <td data-bbox="683 1641 1086 1877"> <p>(4) ITO Pin crack</p>  </td> <td data-bbox="1086 1641 1498 1877"> <p>$a \leq 5$ $b \leq 1/3 \text{ pin length}$ $c \leq t$</p> </td> </tr> <tr> <td data-bbox="683 1877 1086 1964"> <p>(5) Progressive cracks</p> </td> <td colspan="2" data-bbox="1086 1877 1498 1964"> <p>All taken to be unacceptable.</p> </td> </tr> </table>		<p>(1) General crack</p> 	<p>$a \leq 5$ $b \leq 2$ $c \leq t$</p> <p>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>(2) Corner crack</p> 	<p>$a \leq 2.5$ $b \leq 2.5$ $c \leq t$ $a + b \leq 4$</p>	<p>(3) Seal portion crack</p> 	<p>$a \leq \text{The seal width} \times 1/3$ $b \leq t \times 2/3$ $c \leq 5$</p> <p>The numbers of pieces are set at up to 5 pieces.</p>	<p>(4) ITO Pin crack</p> 	<p>$a \leq 5$ $b \leq 1/3 \text{ pin length}$ $c \leq t$</p>	<p>(5) Progressive cracks</p>	<p>All taken to be unacceptable.</p>	
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<p>(5) Progressive cracks</p>	<p>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>

NOTICE:

- 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

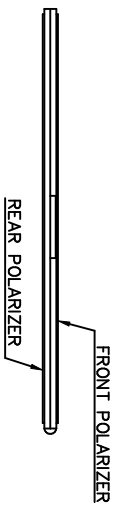
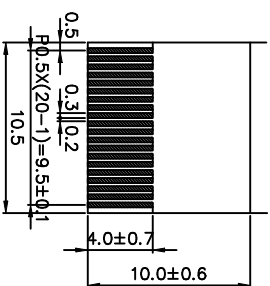
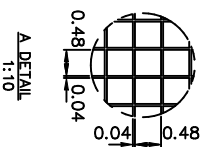
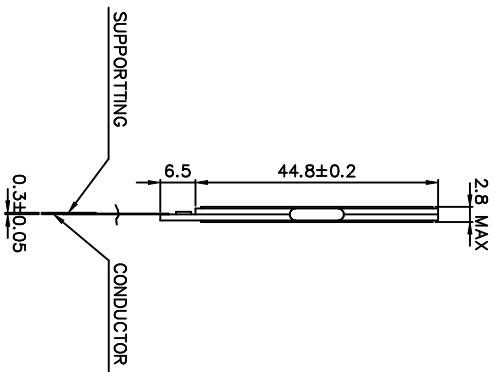
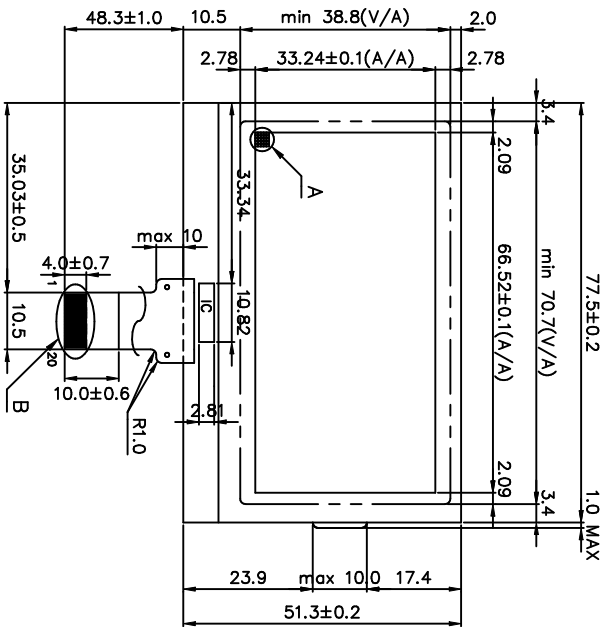
- 1.Avoid static electricity which can damage the CMOS LSI.
- 2.Do not remove the panel or frame from the module.
- 3.The polarizing plate of the display is very fragile. So, please handle it very carefully.
- 4.Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of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



View Direction

Pin No.	Symbol	Function
1	V5	This is a multi-level power supply for the liquid crystal drive. VDD(=V0)≧V1≧V2≧V3≧V4≧V5
2	V4	
3	V3	
4	V2	
5	V1	
6	N.C	N.C
7	CAP2+	Connect a capacitor between this terminal and the CAP2- terminal.
8	CAP2-	Connect a capacitor between this terminal and the CAP2+ terminal.
9	CAP1-	Connect a capacitor between this terminal and the CAP1+ terminal.
10	CAP1+	Connect a capacitor between this terminal and the CAP1- terminal.
11	VOUT	Connect a capacitor between this terminal and the VSS terminal.
12	VSS	DV(GND)
13	VDD	+3V/+5.0V(Logic voltage)
14	D7(S)	Serial data input
15	D6(SCL)	Serial clock input
16	/RD	Fixed to either "H" or to "L"
17	/MR	Fixed to either "H" or to "L"
18	A0	"H"=Display data, "L"=Control data
19	/RES	Reset signal
20	/CS1	Chip select signal

- Note:
- 1.RESOLUTION : 128X64
 - 2.COG IC : SED1565
 - 3.GLASS THICKNESS : 1.1 mm
 - 4.GENERAL TOLERANCE: ±0.2mm

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE
△	MODIFY NEW FORM	05.12.00	J.Y. Lin		
△					
△					
△					


南亚塑膠工業股份有限公司
 NAN YA PLASTICS CORPORATION
製品圖

NAME	DATE	THIRD ANGLE P.
APPROVE	88.03.25	
CHECK	88.03.25	
DESIGN	88.03.24	
DRAWN	88.03.23	UNIT mm

LDAT75R279X
 DWG NO. **DATA75R279X**