

NAN YA PLASTICS CORP.
ELEC. MATERIALS DIV.
LCD DEPARTMENT

SPECIFICATION

SPEC. NO. : LMA39-1
DATE : Dec. 15, 1998
SHEET NO. : 1/22

U.S. MARKETING ARM:

MARK PRODUCTS CORPORATION
800 N. EDGEWOOD AVENUE
WOOD DALE, IL 60191
TEL: 630-787-9089
FAX: 630-787-9015
<http://www.mark-products.com>

SPECIFICATION OF
640x480 COLOR LCD MODULE
PRODUCT NO.: LCBSJTA39M2

SPEC. NO.: LMA39-1-1

CUSTOMER
APPROVED BY
DATE:

EDITED ON : Jul. 06,1999

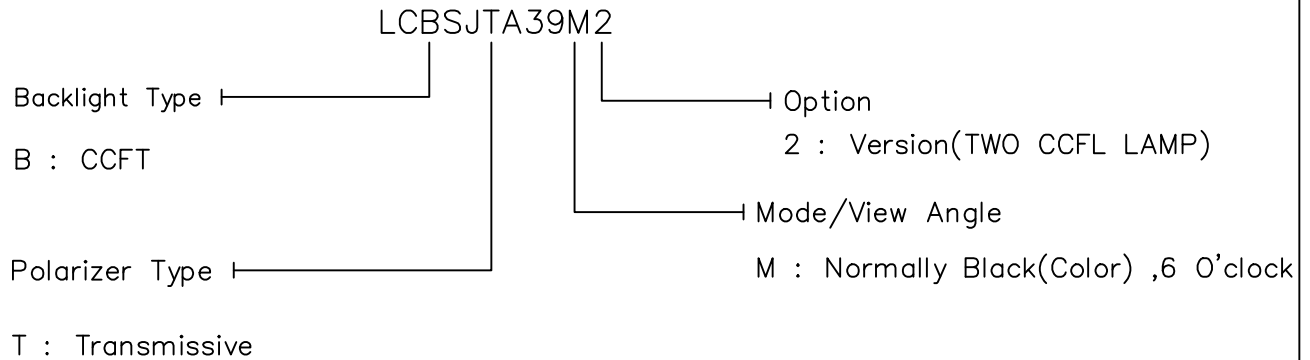
SALE MANAGER	TECHNICAL APPROVE	DESIGN MANAGER	DESIGN CHECK	DESIGNER

REV/DATE	RO/ 12.15.98'					APP	CHK	BY
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1. MECHANICAL DATA

(1) Product No.	LCBSJTA39M2
(2) Module Size	264.0 (W)mm x 183.0 (H)mm x MAX 12.0 (D)mm
(3) Dot Size	0.09 (W)mm x 0.31 (H)mm
(4) Dot Pitch	0.11 (W)mm x 0.33 (H)mm
(5) Number of Dots	640 (W)xRGB x 480 (H)DOTS
(6) Duty	1/240
(7) LCD	FSTN/Black and White/Normally Black/ Negative Image/Color Transmissive Type
(8) Viewing Direction	6 O'clock
(9) Backlight	CCFL
(10) Controller	Excluded
(11) DC/DC Converter	Excluded
(12) Weight	495 g(approx.)

Note :



REV/DATE	R0/ 12.15.98'	R1/ 07.06.99'				APP	CHK	BY
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2. ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

VSS=0V

ITEM	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	-0.3	6.5	V	
Power Supply for LCD Drive	VEE-VSS	0	25.0	V	
Input Voltage	VI	-0.3	VDD+0.3	V	
Static Electricity	-	-	-	-	Note 1

Note 1 LCM should be grounded during handling LCM.

(2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	NORMAL TEMP.			
	OPERATING		STORAGE	
	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	0	50	-20	70
Humidity (Without Condensation)	Note 1,3		Note 2,3	
Vibration	Note 4			

Note 1 $T_a \leq 50^\circ\text{C}$: 85%RH max

$T_a > 50^\circ\text{C}$: Absolute humidity must be lower
than the humidity of 85%RH at 50°C

Note 2 T_a at -20°C will be < 48 hrs, at 70°C will be < 120 hrs

Note 3 Background color will change slightly depending on ambient temperature.
That phenomenon is reversible.

Note 4

Frequency	5 Hz~13.95 Hz	13.95 Hz~33 Hz	33 Hz~51 Hz	51 Hz~500 Hz
Vibration Level	-	2X9.8 m/s ²	-	5x9.8 m/s ²
Vibration Width	0.2 inch	-	0.036 inch	-
Vibration Direction	X/Y/Z			
Vibration Time	20 min-1 cycle X 3 directions			

3. ELECTRICAL CHARACTERISTICS

3.1 ELECTRICAL CHARACTERISTICS OF LCM

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
Logic Circuit Power Supply	VDD-VSS	Ta= 25°C		2.7	3.0	3.3	V
				4.5	5.0	5.5	
Input Voltage	VIH	H level		0.8VDD	-	VDD	V
	VIL	L level		0	-	0.2VDD	V
Recommended LCD Driving Voltage (Normal Temp. LCM)	VEE-VSS	Duty=1/240 Bias=1/13 VDD=5.0V	0°C	23.4	23.8	24.2	V
			25°C	22.6	23.0	23.4	
			50°C	21.4	21.8	22.2	
Supply Current for Logic	IDD	VDD-VSS = 5.0V		-	33.0	40.0	mA
Supply Current for LCD	IEE	VEE-VSS = 23.0V Ta= 25°C		-	12.0	18.0	mA

3.2 ELECTRICAL CHARACTERISTICS OF BACKLIGHT

Used lamp : Rating (ONE LAMP)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Lamp Voltage	V _L	-	640	-	Vrms	
Lamp current	I _L	3	5	7	mArms	
Lamp power consumption	P _L	-	3.2	-	W	
Lamp frequency	F _L	30	45	55	kHz	
Starting voltage	V _s	-	750	1500	Vrms	T _a = 25°C
Color Degree	X	0.287	0.297	0.307	-	
	Y	0.287	0.297	0.307		
Lamp life time	L _L	10000	-	-	hrs	

LCM : Rating

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Surface Luminance	L	-	230	-	cd/m ²	ALL ON(I _L =6 mA) ONE LAMP
		-	18	-	cd/m ²	ALL OFF(I _L =6 mA) ONE LAMP
Luminance Uniformity	Lu	-	82	-	%	White

3.3 INVERTER : TDK TAD250

3.3.1 GENERAL SPECIFICATIONS

3.3.1.1 OPERATION TEMPERATURE : 0°C~50°C

3.3.1.2 STORAGE TEMPERATURE : -20°C~80°C

3.3.1.3 DIMENSION : 95.0(L)mm x 19.5(W)mm x MAX 8.8(H)mm

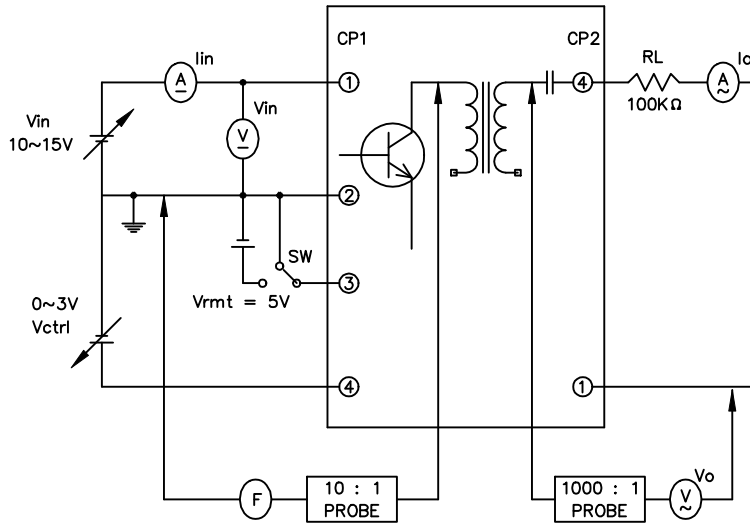
3.3.2 INPUT CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARKS
Input Voltage	Vin	10	12	15	V	
Input Current	Iin	-	450	550	mA	RL = 100KΩ, Vin = 12V
Input Power	Pin	-	5.4	6.6	W	RL = 100KΩ, Vin = 12V
Standby Standby Input Current	Iin Standby	-	0.1	1.0	μA	OFF state
Control Terminal Input Voltage	Vrmt	3.5 -0.5	5 0	10 0.4	V V	ON state OFF state
Control Terminal Input Current	Irmt	- -	0.5 -	1.0 -0.3	mA μA	Vrmt = 5V Vrmt = 0V

3.3.3 OUTPUT CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARKS
NO Load Output Voltage	Vs	1400	-	-	Vrms	
Tube Current	IL	2.7	3	3.3	mA _{rms}	V _{ctrl} = 3V Min. Brightness
		5.4	6	6.6	mA _{rms}	V _{ctrl} = 0V Max. Brightness
Working Frequency	f	35	45	55	kHz	

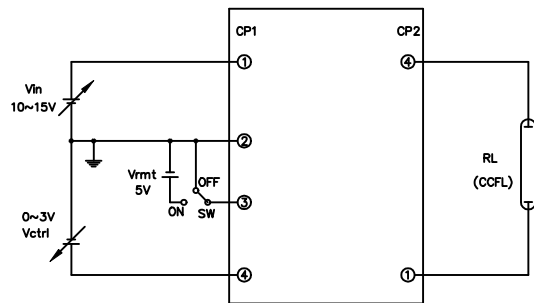
3.3.4 MEASUREMENT



3.3.5 MEASURE INSTRUMENTS

- (A) DIGITAL MULTIMETER
HP 3478A or equivalent
- (V) DIGITAL MULTIMETER
HP 3478A or equivalent
- (A) TRUE RMS MULTIMETER
FLUKE 8060A or equivalent
- (V) TRUE RMS VOLTMETER
HP 3400A or equivalent
- (F) TRUE RMS MULTIMETER
FLUKE 8060A or equivalent

3.3.6 APPLICATION EXAMPLES



3.3.7 PIN ASSIGNMENTS

INPUT (CP1) CONNECTOR :
MOLEX 53261-0590

NO.	SIGNAL
1	Vin
2	Gnd
3	Vrmt
4	Vctrl
5	NC

OUTPUT (CP2) CONNECTOR :
MITSUMI : M60-04-30-134P

NO.	SIGNAL
1	RTN
2	NC
3	NC
4	HV

4. OPTICAL CHARACTERISTICS

4-1. Optical Char. of Normal Temp. Mode

AT V_{OP}

ITEM MODE		Cr(Contrast Ratio)						θ (Viewing Angle)		ϕ (Viewing Angle)	
		0 τ		25 τ		50 τ		25 τ		25 τ	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
T	M	-	20	-	30	-	6	-	40-X	-	60-36
note		NOTE6						NOTE5			

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

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	0 τ	-	650	1000	ms	NOTE 2
		25 τ	-	230	350		
		50 τ	-	115	180		
Response Time (fall)	Tf	0 τ	-	250	400	ms	NOTE 2
		25 τ	-	80	120		
		50 τ	-	60	90		

note:

T : TRANSMISSIVE
M : NORMALLY BLACK(COLOR)

4-2. Color of CIE Coordinate

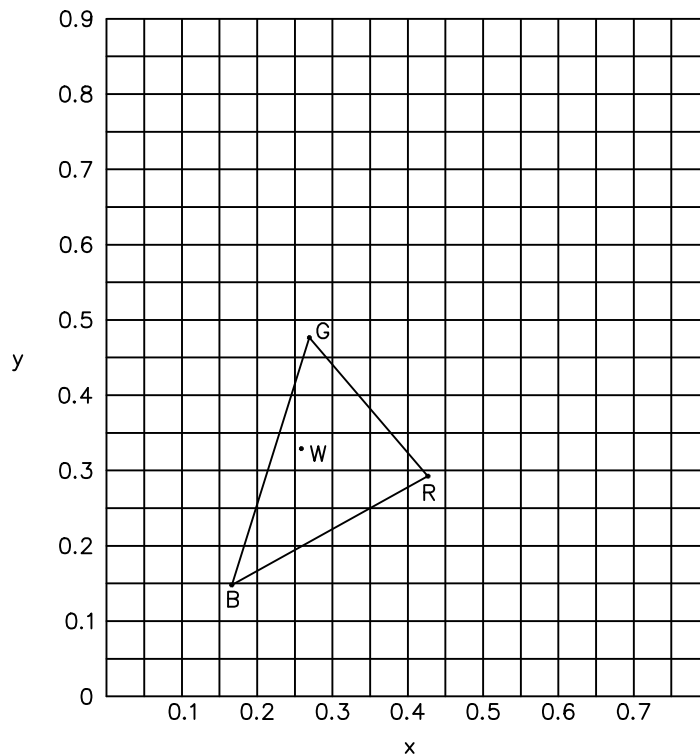
Ta = 25°C

ITEM		SYMBOL	CONDITION	VALUE	NOTE
Color of CIE Coordinate	Red	X	$\phi=0^\circ, \theta=0^\circ$ CCFL BACKLIGHT COLOR DEGREE $X=0.297$ $Y=0.297$	0.4267	Note*
		y		0.2924	
	Green	X		0.2691	
		y		0.4767	
	Blue	X		0.1662	
		y		0.1479	
	White	X		0.2587	
		y		0.3296	

Note* Measuring at position 3 on Fig.1
CIE chromaticity diagram

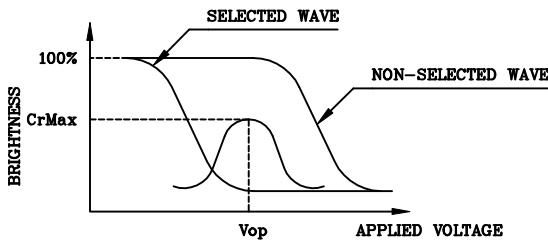
Tolerance : ± 0.05

Fig.1

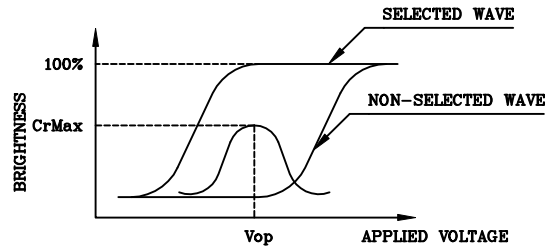


(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



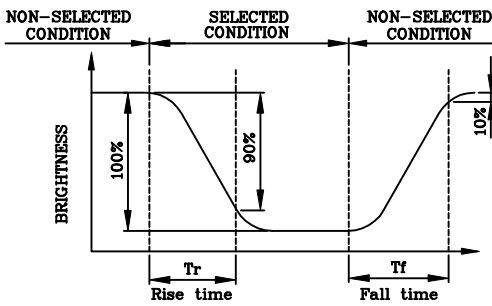
(negative type)

*Conditions

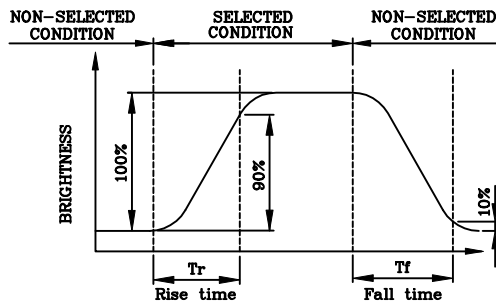
Viewing Angle : 0
Frame Frequency : 70Hz
Applied Waveform : 1/N duty, 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



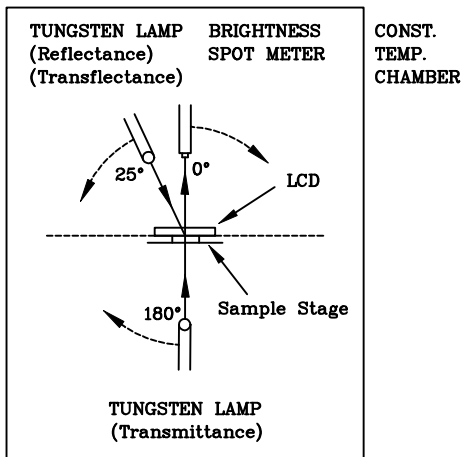
(negative type)

*Conditions

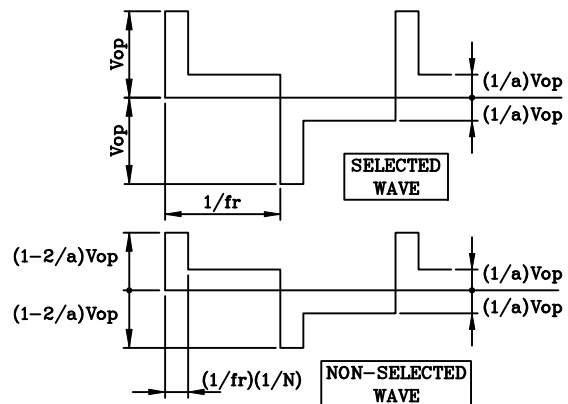
Operating Voltage : Vop
Viewing Angle (θ,φ) : (0,0)
Frame Frequency : 70Hz
Applied Waveform : 1/N duty, 1/a bias

(NOTE 3)

Description of Measuring Equipment and Driving Waveforms

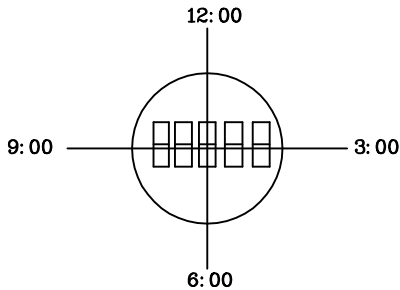


Multiplex Driving (1/N duty, 1/a bias)



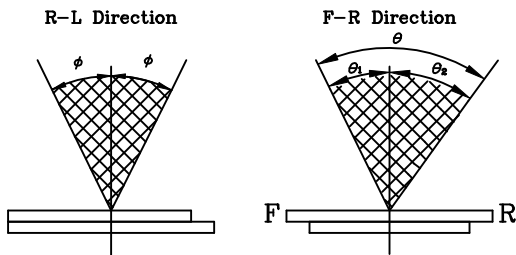
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



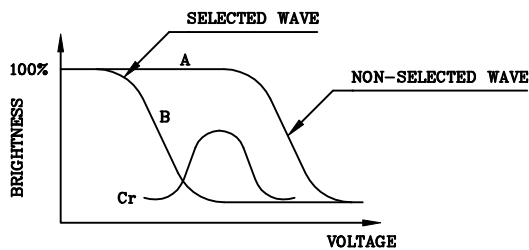
$$\theta = \theta_1 + \theta_2$$

*Conditions

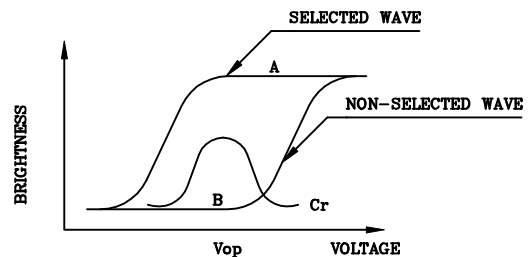
Operating Voltage : V_{op}
 Frame Frequency : 70Hz
 Applied Waveform : 1/N duty, 1/a bias
 Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



(negative type)

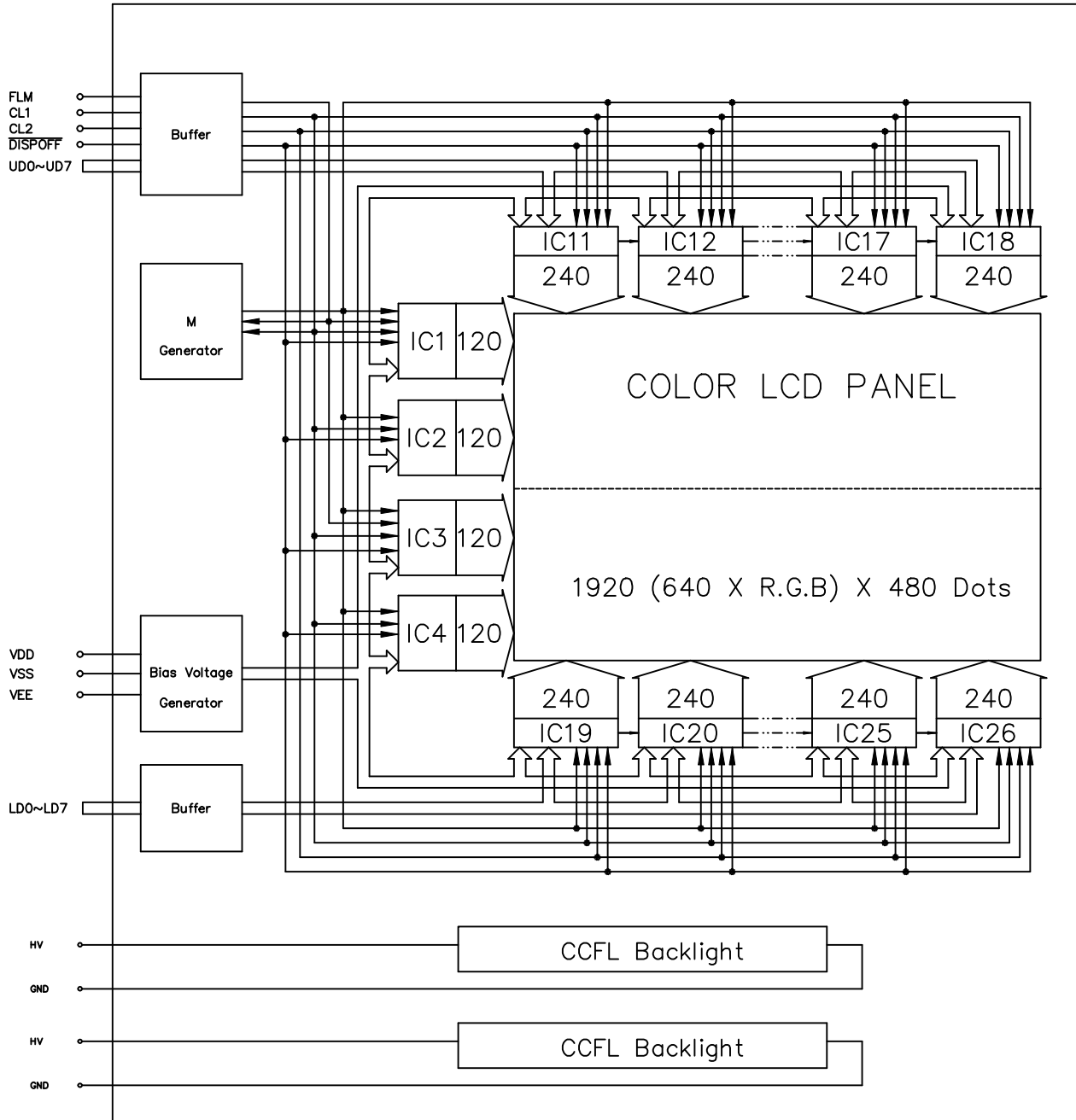
$$\text{Contrast Ratio : } Cr = A/B$$

*Conditions

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

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5. BLOCK DIAGRAM



* M GENERATOR SETTING

J1	J2	J3	J4	J5	J6	J7	J8
L	H	H	L	L	L	L	L

6. INTERFACE PIN CONNECTION

INTERFACE	PIN NO.	SYMBOL	FUNCTION
LCM	CN1	1	FLM The FLM signal indicates the beging of each display cycle.
		2	NC
		3	DISPOFF H ---display ON, L --display OFF
		4	CL1 The CL1 latches the serial data in the shift registers.
		5	VSS GND
		6	CL2 Clock signal for shifting the serial data.
		7	VSS GND
		8	UD0 Display data for upper column driver
		9	UD1 Display data for upper column driver
		10	UD2 Display data for upper column driver
		11	UD3 Display data for upper column driver
		12	UD4 Display data for upper column driver
		13	UD5 Display data for upper column driver
		14	UD6 Display data for upper column driver
		15	UD7 Display data for upper column driver
	CN2	1	LD0 Display data for lower column driver
		2	LD1 Display data for lower column driver
		3	LD2 Display data for lower column driver
		4	LD3 Display data for lower column driver
		5	LD4 Display data for lower column driver
		6	LD5 Display data for lower column driver
		7	LD6 Display data for lower column driver
		8	LD7 Display data for lower column driver
		9	VDD +5V
	10	VSS GND	
	11	VSS GND	
	12	VEE Power supply voltage for LCD (+)	
	13	VEE Power supply voltage for LCD (+)	
14	VEE Power supply voltage for LCD (+)		

CN1:15PIN MOLEX 53261-1590 CN2:14PIN MOLEX 53261-1490

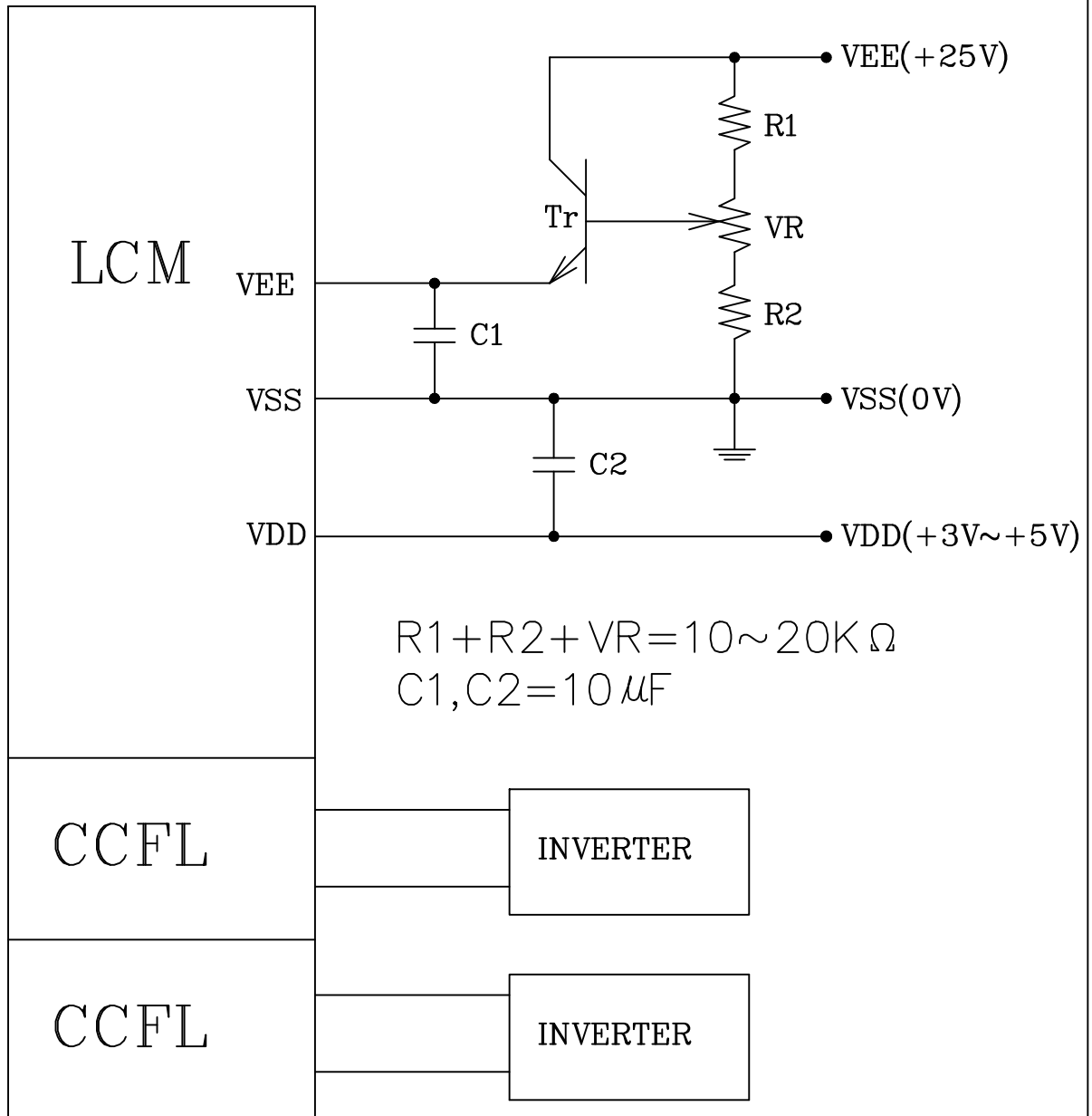
INTERFACE	PIN NO.	SYMBOL	FUNCTION
CFL	FLCN1	1	GND CFL GND
		2	N.C -
		3	N.C -
		4	HV Power supply voltage for CFL

FLCN1: MITSUMI/M63M83-04

(Suitable Connector: MITSUMI/M60-04-30-134P or M60-04-30-114P or M61M73-04)

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7. POWER SUPPLY

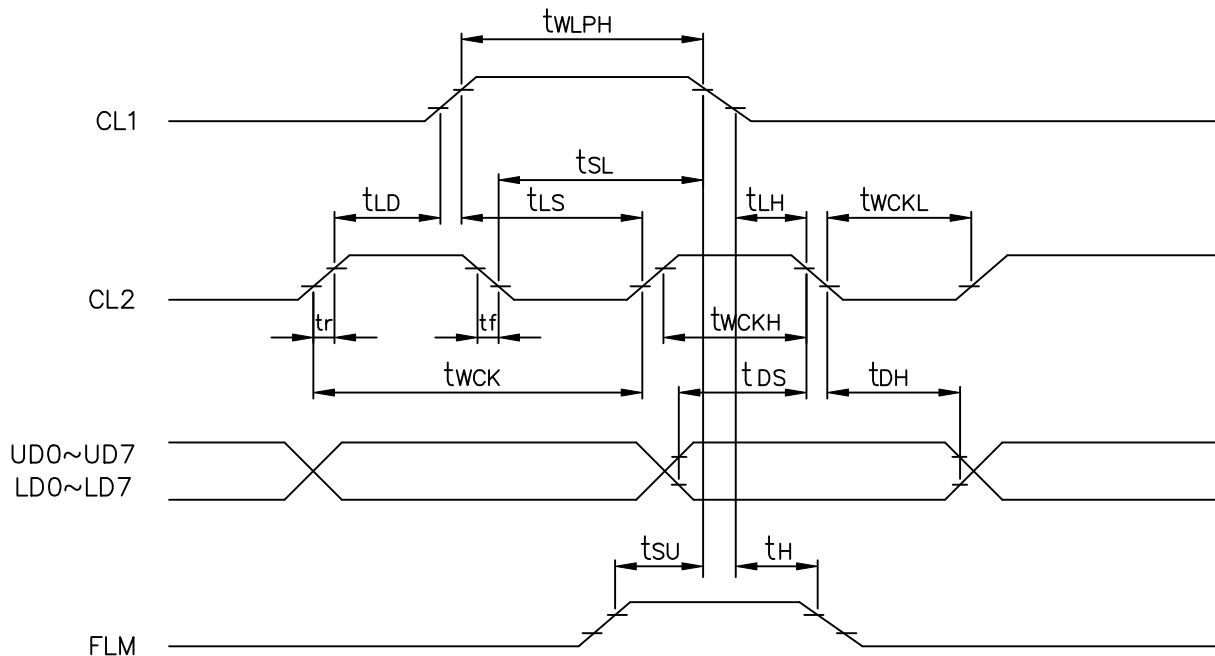


8. TIMING CHARACTERISTICS

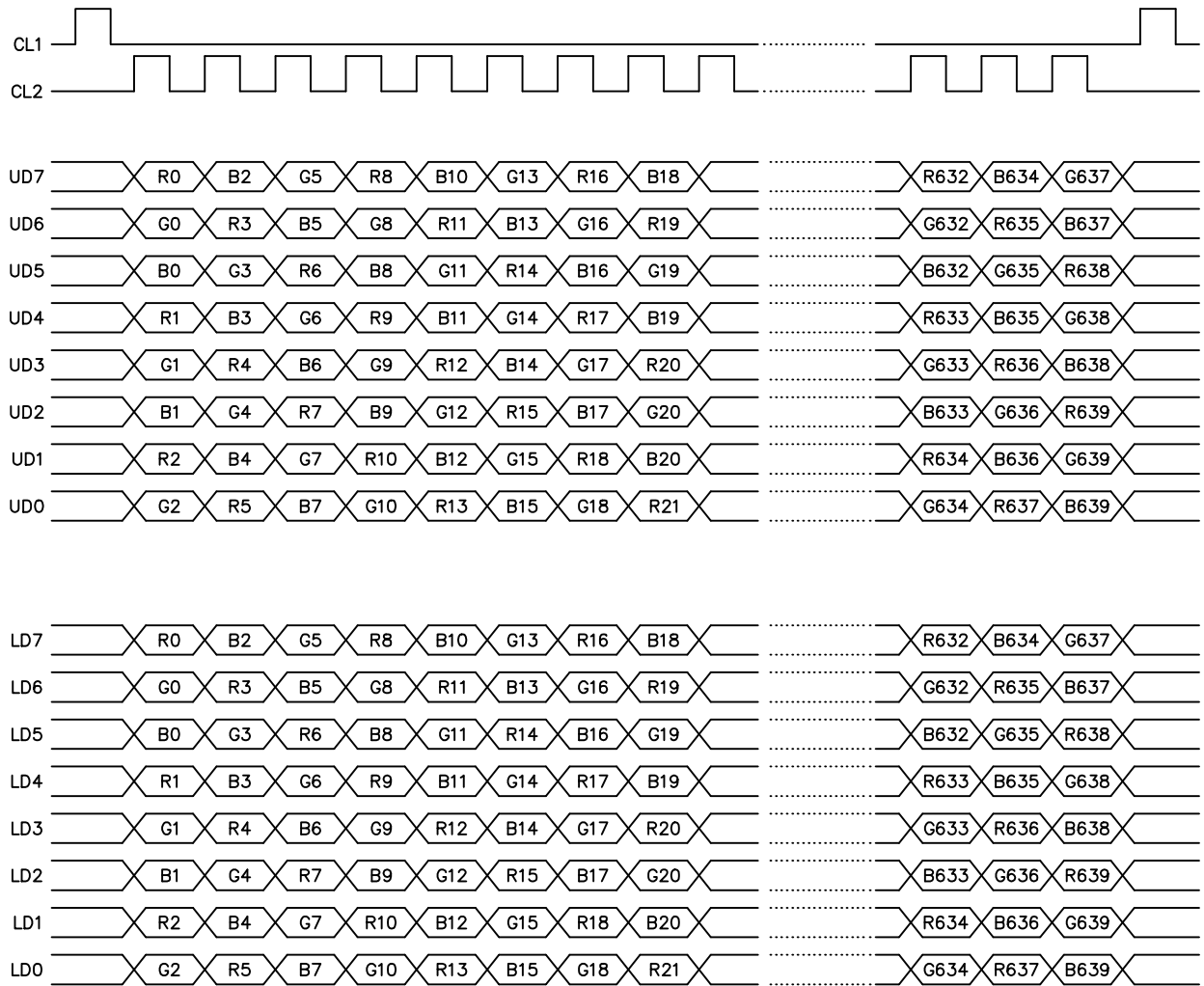
8-1. INTERFACE TIMING

VDD=5.0V ± 10%

Parameter	SYMBOL	MIN.	MAX.	UNIT
CLOCK PULSE CYCLE TIME	t_{wck}	40	-	ns
CLOCK PULSE HIGH LEVEL WIDTH	t_{wckH}	12	-	ns
CLOCK PULSE LOW LEVEL WIDTH	t_{wckL}	14	-	ns
LATCH PULSE HIGH LEVEL WIDTH	t_{wLPH}	15	-	ns
CL2→CL1 RISE TIME	t_{LD}	5	-	ns
CL2→CL1 FALL TIME	t_{SL}	25	-	ns
CL1→CL2 RISE TIME	t_{LS}	25	-	ns
CL1→CL2 FALL TIME	t_{LH}	25	-	ns
CLOCK PULSE RISE/FALL TIME	t_r, t_f	-	50	ns
DATA SETUP TIME	t_{DS}	5	-	ns
DATA HOLD TIME	t_{DH}	15	-	ns
FLM SETUP TIME	t_{SU}	30	-	ns
FLM HOLD TIME	t_H	50	-	ns

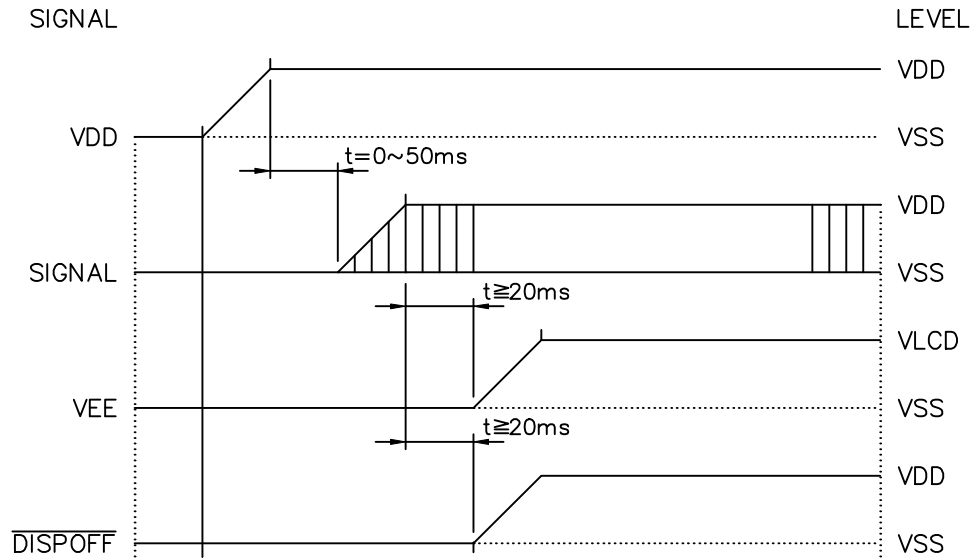


8-2. TIMING CHART

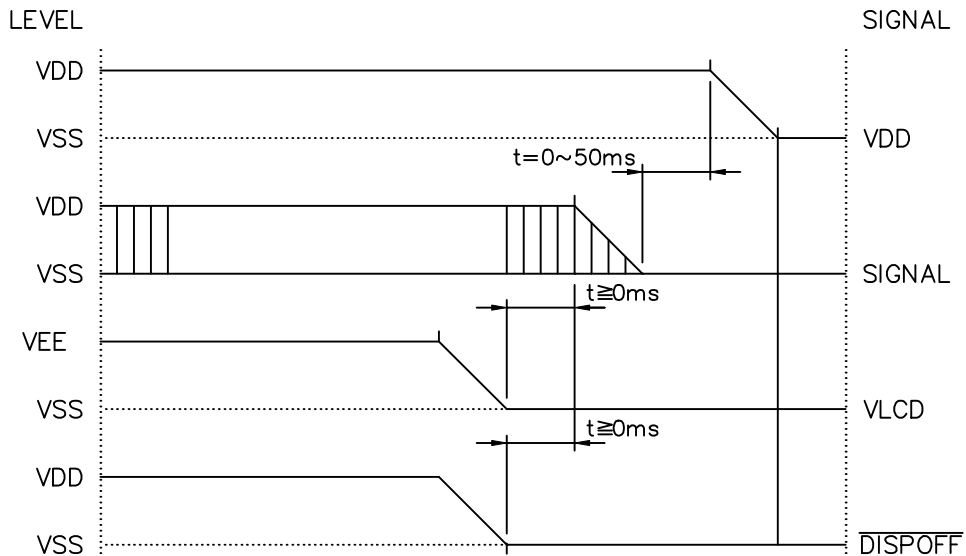


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8-3. POWER ON/OFF TIMING ON SEQUENCE



OFF SEQUENCE



Please maintain the above sequence when turning on and off the power supply of the module. If $\overline{\text{DISPOFF}}$ is supplied to the module while internal alternate signal for LCD driving(M) is unstable, DC component will be supplied to the LCD panel. This may cause damage the LCD module.

9. DISPLAY

	1	2	3	4	5	6	7	8	1913	1914	1915	1916	1917	1918	1919	1920
1	R0 UD7	G0 UD6	B0 UD5	R1 UD4	G1 UD3	B1 UD2	R2 UD1	G2 UD0			G637 UD7	B637 UD6	R638 UD5	G638 UD4	B638 UD3	R639 UD2	G639 UD1	B639 UD0
2	R0 UD7	G0 UD6	B0 UD5	R1 UD4	G1 UD3	B1 UD2	R2 UD1	G2 UD0			G637 UD7	B637 UD6	R638 UD5	G638 UD4	B638 UD3	R639 UD2	G639 UD1	B639 UD0

239	R0 UD7	G0 UD6	B0 UD5	R1 UD4	G1 UD3	B1 UD2	R2 UD1	G2 UD0			G637 UD7	B637 UD6	R638 UD5	G638 UD4	B638 UD3	R639 UD2	G639 UD1	B639 UD0
240	R0 UD7	G0 UD6	B0 UD5	R1 UD4	G1 UD3	B1 UD2	R2 UD1	G2 UD0			G637 UD7	B637 UD6	R638 UD5	G638 UD4	B638 UD3	R639 UD2	G639 UD1	B639 UD0
241	R0 LD7	G0 LD6	B0 LD5	R1 LD4	G1 LD3	B1 LD2	R2 LD1	G2 LD0			G637 LD7	B637 LD6	R638 LD5	G638 LD4	B638 LD3	R639 LD2	G639 LD1	B639 LD0
242	R0 LD7	G0 LD6	B0 LD5	R1 LD4	G1 LD3	B1 LD2	R2 LD1	G2 LD0			G637 LD7	B637 LD6	R638 LD5	G638 LD4	B638 LD3	R639 LD2	G639 LD1	B639 LD0

479	R0 LD7	G0 LD6	B0 LD5	R1 LD4	G1 LD3	B1 LD2	R2 LD1	G2 LD0			G637 LD7	B637 LD6	R638 LD5	G638 LD4	B638 LD3	R639 LD2	G639 LD1	B639 LD0
480	R0 LD7	G0 LD6	B0 LD5	R1 LD4	G1 LD3	B1 LD2	R2 LD1	G2 LD0			G637 LD7	B637 LD6	R638 LD5	G638 LD4	B638 LD3	R639 LD2	G639 LD1	B639 LD0

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 Humidity Storage	40°C 90%RH	120HR		Appearance without defect	
4	Thermal Shock	-20°C,30min → 25°C,5min → 60°C,30min → 25°C,5min (= 1 cycle)			Appearance without defect	5 cycles

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12.15.98'

APP

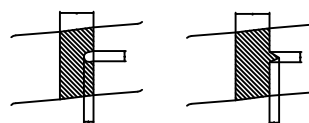
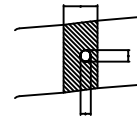
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BY

11. LCD PRODUCT QUALITY STANDARD

(1) DISPLAY APPEARANCE

NO	ITEM	C R I T E R I A													
1.	INCLUSIONS (BLACK SPOT , WHITE SPOT , DUST)	(1) ROUND TYPE													
		<table border="1"> <thead> <tr> <th>DIAMETER mm (a*)</th> <th>NO. OF DEFECT*</th> </tr> </thead> <tbody> <tr> <td>a ≦ 0.20</td> <td>NEGLECT</td> </tr> <tr> <td>0.20 < a ≦ 0.35</td> <td>5 MAX</td> </tr> <tr> <td>0.35 < a</td> <td>NONE</td> </tr> </tbody> </table>	DIAMETER mm (a*)	NO. OF DEFECT*	a ≦ 0.20	NEGLECT	0.20 < a ≦ 0.35	5 MAX	0.35 < a	NONE					
DIAMETER mm (a*)	NO. OF DEFECT*														
a ≦ 0.20	NEGLECT														
0.20 < a ≦ 0.35	5 MAX														
0.35 < a	NONE														
		(2) LINEAR TYPE													
		<table border="1"> <thead> <tr> <th>LENGTH mm(L)</th> <th>WIDTH mm(W)</th> <th>NO. OF DEFECT</th> </tr> </thead> <tbody> <tr> <td>N A</td> <td>W ≦ 0.03</td> <td>NEGLECT</td> </tr> <tr> <td>L ≦ 3</td> <td>0.03 < W ≦ 0.08</td> <td>6</td> </tr> <tr> <td>3 < L</td> <td>0.08 < W</td> <td>NONE</td> </tr> </tbody> </table>	LENGTH mm(L)	WIDTH mm(W)	NO. OF DEFECT	N A	W ≦ 0.03	NEGLECT	L ≦ 3	0.03 < W ≦ 0.08	6	3 < L	0.08 < W	NONE	
LENGTH mm(L)	WIDTH mm(W)	NO. OF DEFECT													
N A	W ≦ 0.03	NEGLECT													
L ≦ 3	0.03 < W ≦ 0.08	6													
3 < L	0.08 < W	NONE													
2.	SCRATCH	1.SCRATCH ON PROTECTIVE FILM IS PERMITTED . 2.SCRATCH ON POLARIZER SHALL BE AS FOLLOW: (1) ROUND TYPE													
		<table border="1"> <thead> <tr> <th>DIAMETER mm (a*)</th> <th>NO. OF DEFECT*</th> </tr> </thead> <tbody> <tr> <td>a ≦ 0.15</td> <td>NEGLECT</td> </tr> <tr> <td>0.15 < a ≦ 0.20</td> <td>2 MAX</td> </tr> <tr> <td>0.20 < a</td> <td>NONE</td> </tr> </tbody> </table>	DIAMETER mm (a*)	NO. OF DEFECT*	a ≦ 0.15	NEGLECT	0.15 < a ≦ 0.20	2 MAX	0.20 < a	NONE					
DIAMETER mm (a*)	NO. OF DEFECT*														
a ≦ 0.15	NEGLECT														
0.15 < a ≦ 0.20	2 MAX														
0.20 < a	NONE														
		(2) LINEAR TYPE BE JUDGED BY 1.-(2) LINEAR TYPE													
3.	DENT	DIAMETER < 1.5mm													
4.	BUBBLE	NOT EXCEEDING 0.5mm AVERAGE DIAMETER IS ACCEPTABLE BETWEEN GLASS AND POLARIZING FILM.													
5.	PIN HOLE	(a+b)/2 ≦ 0.15 mm MAXIMUM NUMBER: IGNORED													
		0.15 < (a+b)/2 ≦ 0.20 MAXIMUM NUMBER: 10													
6.	DOT DEFECT	(a+b)/2 ≦ 0.20 mm MAXIMUM NUMBER: IGNORED													
		0.20 < (a+b)/2 ≦ 0.30 MAXIMUM NUMBER: 5 x = WIDTH													
7.	CONTRAST IRREGULARITY (SPOT)	DIAMETER SPEC.													
		<table border="1"> <thead> <tr> <th>NO. OF DEFECT*</th> </tr> </thead> <tbody> <tr> <td>a ≦ 0.50 mm</td> <td>NEGLECT</td> </tr> <tr> <td>0.50 < a ≦ 0.75</td> <td>5</td> </tr> <tr> <td>0.75 < a ≦ 1.00</td> <td>3</td> </tr> <tr> <td>1.00 < a</td> <td>NONE</td> </tr> </tbody> </table>	NO. OF DEFECT*	a ≦ 0.50 mm	NEGLECT	0.50 < a ≦ 0.75	5	0.75 < a ≦ 1.00	3	1.00 < a	NONE				
NO. OF DEFECT*															
a ≦ 0.50 mm	NEGLECT														
0.50 < a ≦ 0.75	5														
0.75 < a ≦ 1.00	3														
1.00 < a	NONE														
8.	DOT WIDTH	DESIGN WIDTH ±15%													
9.	COLOR TONE AND UNIFORMITY	OBVIOUS UNEVEN COLOR IS NOT PERMITTED													



NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT	SPECIFICATION	SPEC. NO. : LMA39-1 DATE : Dec. 15, 1998 SHEET NO. : 21/22
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(2) NOTE:

- POWER ON SEQUENCE

1.The power ON/OFF sequence is very important for LCM, we recommend using the following power ON/OFF sequence :

POWER ON : power on VDD (logic power supply) before power on VEE (power supply for LCD drive).

POWER OFF : power off VEE before VDD.

Failure to follow this power ON/OFF sequence may result in damage to the drivers ICs.

2.LCM connection :

We strongly suggest never shorting the VEE with other interface pin. This may result in damage to the module driver ICs or interface controller IC.

- SAFETY

- 1.If the LCD panel breaks, be careful not to allow 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.Prevent all contact with static electricity, which can damage the CMOS ICs. The module is packaged in a static-shielding bag to prevent damage during shipment, warehousing and removal from the shipping carton.
- 2.Do not remove the panel or frame from the module.
- 3.The polarizing plate on the front surface of the display is very fragile and easily scratched. The module is shipped with a protective liner which must be removed from the polarizing plate prior to assembly.
- 4.Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of polarizing plate.
- 5.Do not use ketonics solvent or aromatic solvent on the polarizing plate. Use a soft cloth soaked with plastic-lens cleaning solution.

- 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 WARRANTY

- 1.Acceptance inspection period
The inspection period is within one month after the arrival of the contracted goods at the buyer's factory site.
- 2.Applicable warranty period
The warranty period is within twelve months from the date of invoice under normal usage and storage conditions.

- TYPICAL OPERATING LIFETIME OF BACKLIGHT

CCFT : 10,000HR

REV/DATE	RO/ 12.15.98'					APP	CHK	BY
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