



CLOVER DISPLAY LTD.

LCD MODULE SPECIFICATION

Model: CG9864A - _ _ - _ _ - _ _ - _

Revision	00
Engineering	Timothy Chan
Date	22 October 2021
Our Reference	X9069

ADDRESS : 1st FLOOR, EFFICIENCY HOUSE, 35 TAI YAU STREET, SAN PO KONG,
KOWLOON, HONG KONG.

TEL : (852) 2341 3238 (SALES OFFICE) (852) 2342 8228 (GENERAL OFFICE)

FAX : (852) 2357 4237 (SALES OFFICE)

E-MAIL : cdl@cloverdisplay.com

URL : <http://www.cloverdisplay.com>

MODE OF DISPLAY**Display mode**

STN : ☐ Yellow green
☐ Grey
☐ Blue (negative)
☐ FSTN positive
☐ FSTN negative

Display condition

☐ Reflective type
☐ Transflective type
☐ Transmissive type
☐ Others

Viewing direction

☐ 6 O' clock
☐ 12 O' clock
☐ 3 O' clock
☐ 9 O' clock

LCD MODULE NUMBER NOTATION:

CG9864A- N N - S R - N 6 - T

| | | | | | | |
 (1) (2) (3) (4) (5) (6) (7) (8)

*(1)---Model number of standard LCD Modules

*(2)---Backlight type

N – No backlight
 E – EL backlight
 L – Side-lited LED backlight
 M– Array LED backlight
 C – CCFL

*(3)---Backlight color

N – No backlight
 A – Amber
 B – Blue
 O– Orange
 W–White
 Y – Yellow green
 R – Red
 G – Green

*(4)---Display mode

T – TN
 V – TN (Negative)
 S – STN Yellow green
 G – STN Grey
 B – STN Blue (Negative)
 F – FSTN
 N – FSTN (Negative)

*(5)---Rear polarizer type

R – Reflective
 F – Transflective
 T – Transmissive

*(6)---Temperature range

N – Normal
 W– Extended

*(7)---Viewing direction

6 – 6 O'clock
 2 – 12 O'clock
 3 – 3 O'clock
 9 – 9 O'clock

*(8)--- Special code for other requirements
 (Can be omitted if not used)

GENERAL DESCRIPTION

Display mode : 98 x 64 dots, Graphic COG LCD module
 Interface : Serial
 Driving method : 1/64 duty, 1/9 bias
 Controller IC : Sitronix ST7567 or equivalent
 For the detailed information, please refer to the IC specifications.

MECHANICAL DIMENSIONS

Item	Dimension	Unit	Item	Dimension	Unit
Outline Dimension			Viewing Area	34.0(L)x22.0(W)	mm
No Backlight (N)	37.0(L)x33.0(W)x2.15max.(H)	mm	Dot Pitch	0.30(L)x0.30(W)	mm
LED Sided Backlight(L)	37.0(L)x33.0(W)x4.50max.(H)	mm	Dot Size	0.27(L)x0.27(W)	mm

CONNECTOR PIN ASSIGNMENT

Pin No.	Symbol	Function
1~4	NC	NO connection
5	VG	LCD driving voltage
6~7	NC	NO connection
8	XV0	LCD driving voltage
9	V0	LCD driving voltage
10~11	NC	NO connection
12	VSS	Ground
13	VDD	Supply voltage for logic
14	D7	Serial data input
15	D6	Serial clock input
16	A0	Data control signal
17	RSTB	Hardware reset input pin
18	CSB	Chip select input pin
*19	A	Supply voltage for backlight(+VE)
*20	K	Supply voltage for backlight(-VE)

Note (*): Pin 19, 20 are used for backlight version.

NO backlight version
Side-lit/lifted backlight version

Top View Dimensions:
 Overall: 37.0 (MAX), 27.0
 V.A. 34.00, A.A. 29.37
 V.A. 22.00, A.A. 19.17
 98 x 64 Dots

Side View Dimensions:
 1.0 MAX, 10.0 MAX, 10.0, 2.0, 25.0, 11.75, 8.55, 1.0, 18, 9.5, Pitch 0.5X(18-1)=8.5

Detail View Dimensions:
 4.5 MAX, 3.0, 3.0, 0.30, 0.27, 2.15 MAX, 33.0, 0.30, 0.27, 0.30, 0.27

Labels: SILICONE, STIFFENER, CONTACT SIDE, NO BACKLIGHT, SIDE-LIT/LIFTED BACKLIGHT

MARK	REASON	DATE
△		
△		
△		
△		

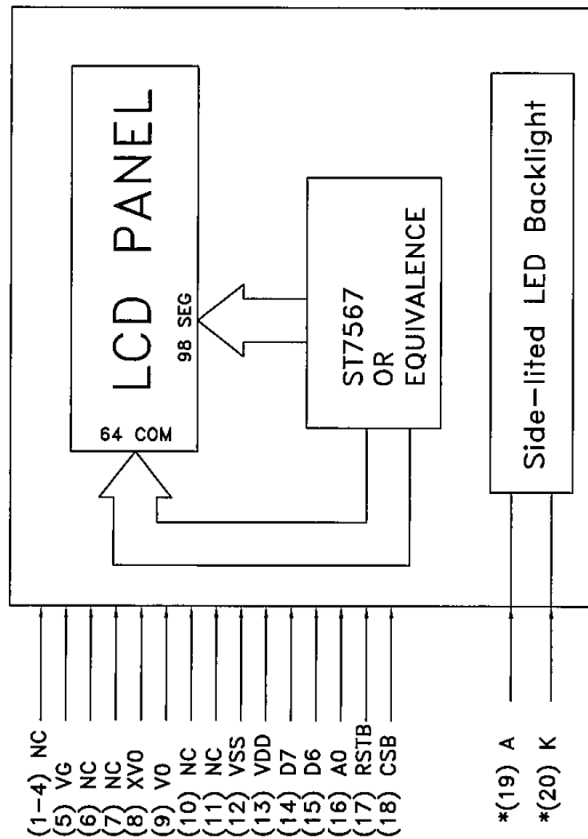
CLOVER DISPLAY LTD. (HK)		SHEET 1 OF 3
MODEL NO. CG9864A	APPROVED	
TITLE: MODULE DIMENSION	APPROVED	
DRAWN BY: FQAI	DATE: 22 OCT 21	
CHECKED BY: <i>Ying</i>	DATE: 20 OCT 21	
APPROVED BY: <i>[Signature]</i>	DATE: 20 OCT 21	

TOLERANCE IF NOT SPECIFY ±0.5mm	REVISION RECORD	SCALE N.T.S.	UNIT IN mm
00	1st ISSUE		DATE 22 OCT 21


CUSTOMER	CUSTOMER REF.
STANDARD	
AGENT	

COUNTER DRAWING OF PIN OUT & BLOCK DIAGRAM

PIN NUMBER	SYMBOL	FUNCTION
1~4	NC	NO connection
5	VG	LCD driving voltage
6	NC	NO connection
7	NC	NO connection
8	XV0	LCD driving voltage
9	V0	LCD driving voltage
10	NC	NO connection
11	NC	NO connection
12	VSS	Ground
13	VDD	Supply voltage for logic
14	D7	Serial data input
15	D6	Serial clock input
16	A0	Data control signal
17	RSTB	Hardware reset input pin
18	CSB	Chip select input pin
*19	A	Supply voltage for backlight (+VE)
*20	K	Supply voltage for backlight (-VE)



Note(*):Pin19,20 are for side-lited LED backlight versions only

TOLERANCE IF NOT SPECIFY ±0.5mm		SCALE N.T.S.	UNIT IN mm		 CLOVER DISPLAY LTD. (HK)	SHEET 2 OF 3
REV.	REVISION RECORD	DATE		CUSTOMER	APPROVED	MODEL NO. CG9864A
00	1st ISSUE	22 OCT 21		STANDARD		
				AGENT	APPROVED	
				CUSTOMER REF.	OUR REF. X9069	DATE : 22 OCT 21
						CHECKED BY : <i>Inty</i> DATE : 20 OCT 21
						APPROVED BY : <i>[Signature]</i> DATE : 22 OCT 21

ELECTRICAL CHARACTERISTICS

Conditions: VSS=0V, Ta=25°C

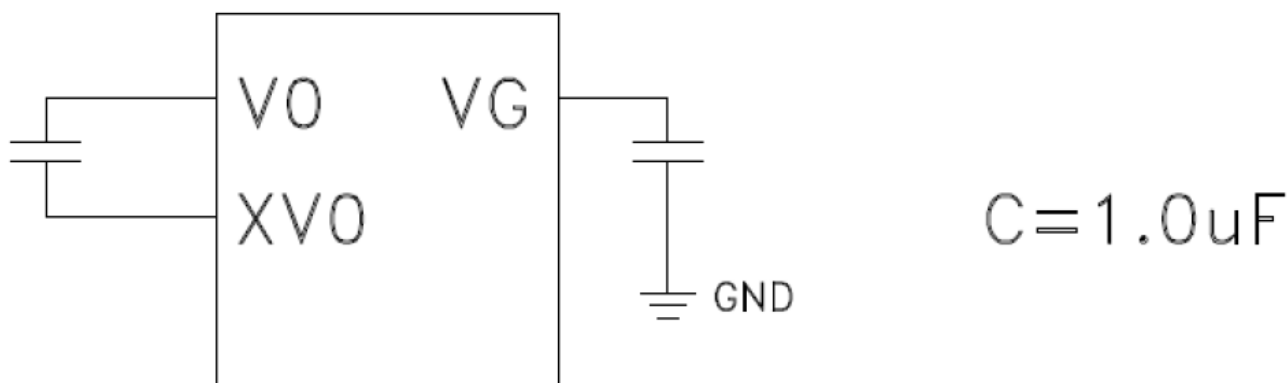
Item	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage for Logic	VDD	2.75	3.0	3.30	V
Supply Current for Logic	IDD	—	0.21	0.32	mA
Operating Voltage for LCD	VLCD	11.4	12.0	12.6	V
‘High’ Level Input Voltage	VIH	0.7VDD	—	VDD	V
‘Low’ Level Input Voltage	VIL	VSS	—	0.3VDD	V

Note (*): There is tolerance in optimum LCD driving voltage during production and it will be within the specified range.

Side BL:

Constant voltage driving:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Blue Backlight current	IBL	—	30	40	mA	VBL = 3.6V
White Backlight current	IBL	—	20	25	mA	VBL = 3.6V
Red Backlight current	IBL	—	30	40	mA	VBL = 3.6V
Green Backlight current	IBL	—	20	30	mA	VBL = 3.6V

REFERENCE CIRCUIT EXAMPLE**ABSOLUTE MAXIMUM RATINGS**

Please make sure not to exceed the following maximum rating values under the worst application conditions

Item	Symbol	Rating (for normal temperature)	Rating (for wide temperature)	Unit
Supply Voltage	VDD	-0.3 to 3.6	-0.3 to 3.6	V
Operating Temperature	Topr	0 to 50	-20 to 70	°C
Storage Temperature	Tstg	-10 to 60	-30 to 80	°C

INSTRUCTION TABLE

INSTRUCTION	A0	R/W (RWR)	COMMAND BYTE								DESCRIPTION
			D7	D6	D5	D4	D3	D2	D1	D0	
(1) Display ON/OFF	0	0	1	0	1	0	1	1	1	D	D=1, display ON D=0, display OFF
(2) Set Start Line	0	0	0	1	S5	S4	S3	S2	S1	S0	Set display start line
(3) Set Page Address	0	0	1	0	1	1	Y3	Y2	Y1	Y0	Set page address
(4) Set Column Address	0	0	0	0	0	1	X7	X6	X5	X4	Set column address (MSB)
	0	0	0	0	0	0	X3	X2	X1	X0	Set column address (LSB)
(5) Read Status	0	1	0	MX	D	RST	0	0	0	0	Read IC Status
(6) Write Data	1	0	D7	D6	D5	D4	D3	D2	D1	D0	Write display data to RAM
(7) Read Data	1	1	D7	D6	D5	D4	D3	D2	D1	D0	Read display data from RAM
(8) SEG Direction	0	0	1	0	1	0	0	0	0	MX	Set scan direction of SEG MX=1, reverse direction MX=0, normal direction
(9) Inverse Display	0	0	1	0	1	0	0	1	1	INV	INV =1, inverse display INV =0, normal display
(10) All Pixel ON	0	0	1	0	1	0	0	1	0	AP	AP=1, set all pixel ON AP=0, normal display
(11) Bias Select	0	0	1	0	1	0	0	0	1	BS	Select bias setting 0=1/9; 1=1/7 (at 1/65 duty)
(12) Read-modify-Write	0	0	1	1	1	0	0	0	0	0	Column address increment: Read:+0 , Write:+1
(13) END	0	0	1	1	1	0	1	1	1	0	Exit Read-modify-Write mode
(14) RESET	0	0	1	1	1	0	0	0	1	0	Software reset
(15) COM Direction	0	0	1	1	0	0	MY	-	-	-	Set output direction of COM MY=1, reverse direction MY=0, normal direction
(16) Power Control	0	0	0	0	1	0	1	VB	VR	VF	Control built-in power circuit ON/OFF
(17) Regulation Ratio	0	0	0	0	1	0	0	RR2	RR1	RR0	Select regulation resistor ratio
(18) Set EV	0	0	1	0	0	0	0	0	0	1	Double command!! Set electronic volume (EV) level
	0	0	0	0	EV5	EV4	EV3	EV2	EV1	EV0	
(19) Set Booster	0	0	1	1	1	1	1	0	0	0	Double command Set booster level: BL=0: 4X BL=1: 5X
	0	0	0	0	0	0	0	0	0	BL	
(20) Power Save	0	0	Compound Command								Display OFF + All Pixel ON
(21) NOP	0	0	1	1	1	0	0	0	1	1	No operation
(22) Test	0	0	1	1	1	1	1	1	1	TE	Test Command Moe TE=0: releasing test command mode TE=1: entering test command mode

Note: Symbol “-” means this bit can be “H” or “L”.

RECOMMENDED INITIAL SETTINGS

Initial Display Line : 40H

LCD Bias Select : A2H

Power Control : 2FH

COM Direction Select : C8H

SEG Direction Select : A0H

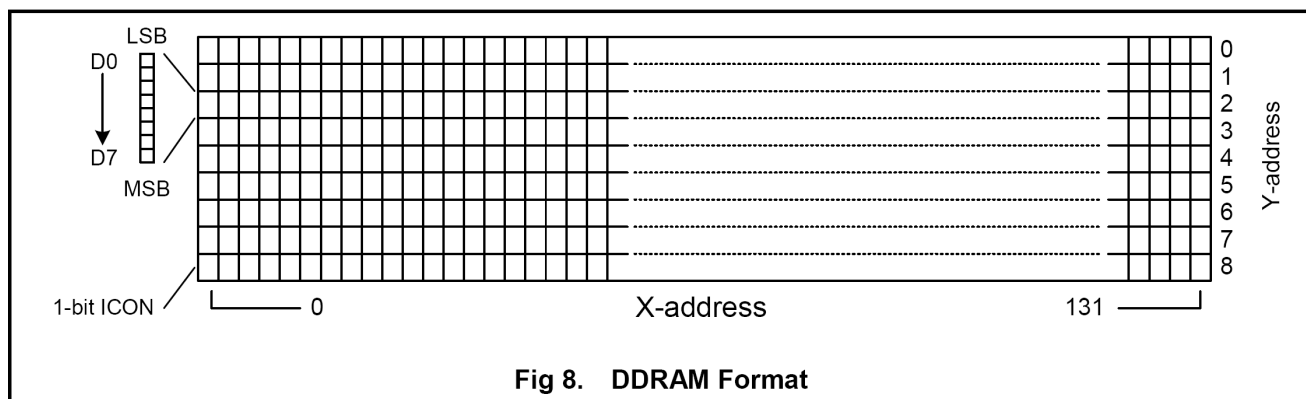
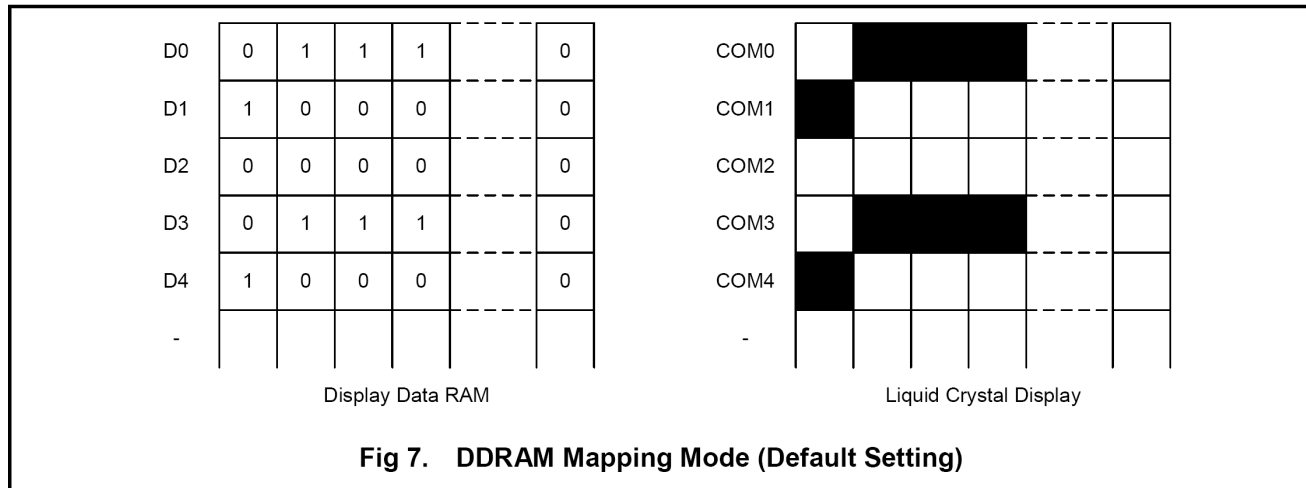
Regulator Resistor Select : 26H

Set Reference Voltage Register : 81H,38H

Set Display On : AFH

DISPLAY DATA RAM (DDRAM)

ST7567 is built-in a RAM with 65X132 bit capacity which stores the display data. The display data RAM (DDRAM) store the dot data of the LCD. It is an addressable array with 132 columns by 65 rows (8-page with 8-bit and 1-page with 1-bit). The X-address is directly related to the column output number. Each pixel can be selected when the page and column addresses are specified (please refer to Fig 7 for detailed illustration). The rows are divided into: 8 pages (Page-0 ~ Page-7) each with 8 lines (for COM0~63) and Page-8 with only 1 line (COMS, for icon). The display data (D7~D0) corresponds to the LCD common-line direction and D0 is on top. All pages can be accessed through D[7:0] directly except icon page. Icon RAM uses only 1-bit of data bus (D0). Refer to Fig 8 for detailed illustration. The microprocessor can write to and read from (only Parallel interfaces) DDRAM by the I/O buffer. Since the LCD controller operates independently, data can be written into DDRAM at the same time as data is being displayed without causing the LCD flicker or data-conflict.



Addressing

Data is downloaded into the Display Data RAM matrix in ST7567 as byte-format. The Display Data RAM has a matrix of 65 by 132 bits. The address ranges are: X=0~131 (column address), Y=0~8 (page address). Addresses outside these ranges are not allowed.

Page Address Circuit

This circuit provides the page address of DDRAM. It incorporates 4-bit Page Address Register which can be modified by the "Page Address Set" instruction only. The Page Address must be set before accessing DDRAM content. Page Address "8" is a special RAM area for the icons with only one valid bit: D0.

Column Address Circuit

The column address of DDRAM is specified by the Column Address Set command. Column Address Circuit has 8-bit preset counter that provides Column Address to the Display Data RAM (DDRAM). This allows MPU accessing DDRAM content continuously. The column address is automatically incremented from the start up to the end column. During auto-increment, the column address returns to the start address as the end column (counter value) is reached.

Furthermore, Register MX and MY makes it possible to invert the relationship between the DDRAM and the outputs (COM/SEG). It is necessary to rewrite the display data into DDRAM after changing MX setting.

Line Address Circuit

The Line Address Circuit incorporates a counter and a Line Address register which is changed only by the "Display Start Line Set" instruction. This circuit assigns DDRAM a Line Address corresponding to the first display line (COM0). Therefore, by setting Line Address repeatedly, ST7567 can realize the screen scrolling without changing the contents of DDRAM as shown in Fig 10. The last common is always the COMS (common output for the icons). That means the icons will never scroll with the general display data.

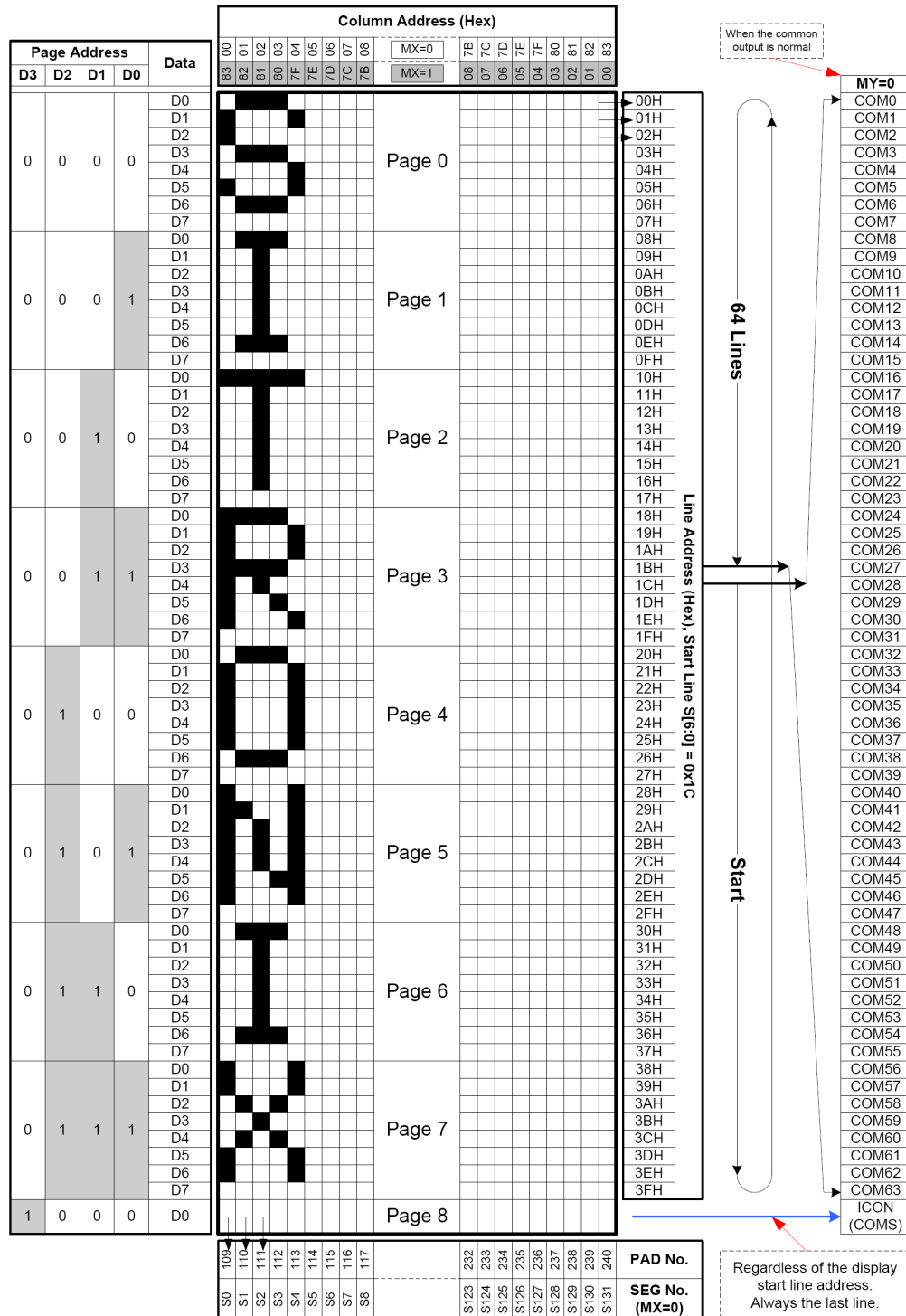


Fig 10. Start Line Function

DISPLAY DATA RAM MAP

The relation between DDRAM and outputs with different MX or MY setting is shown below.

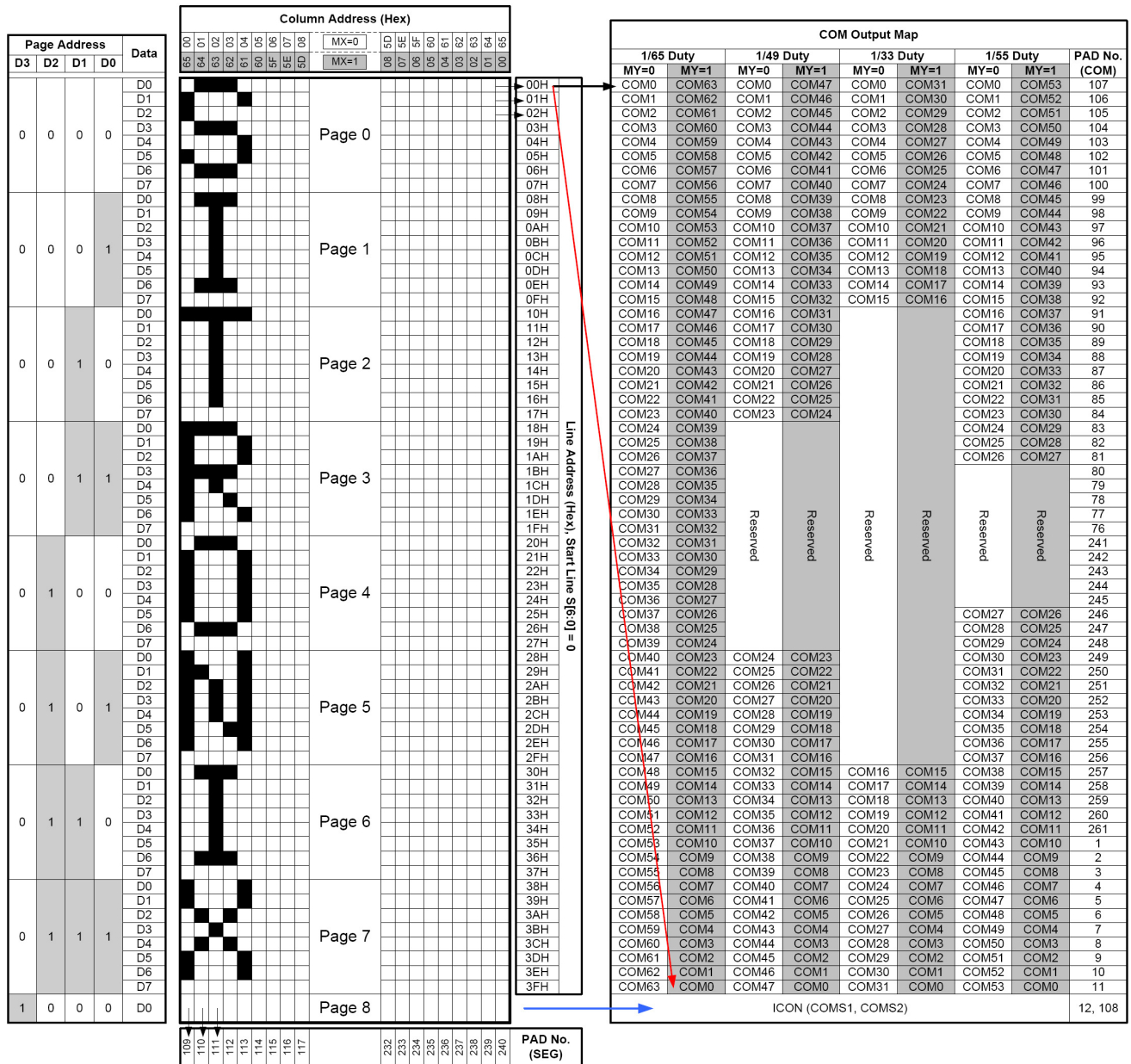
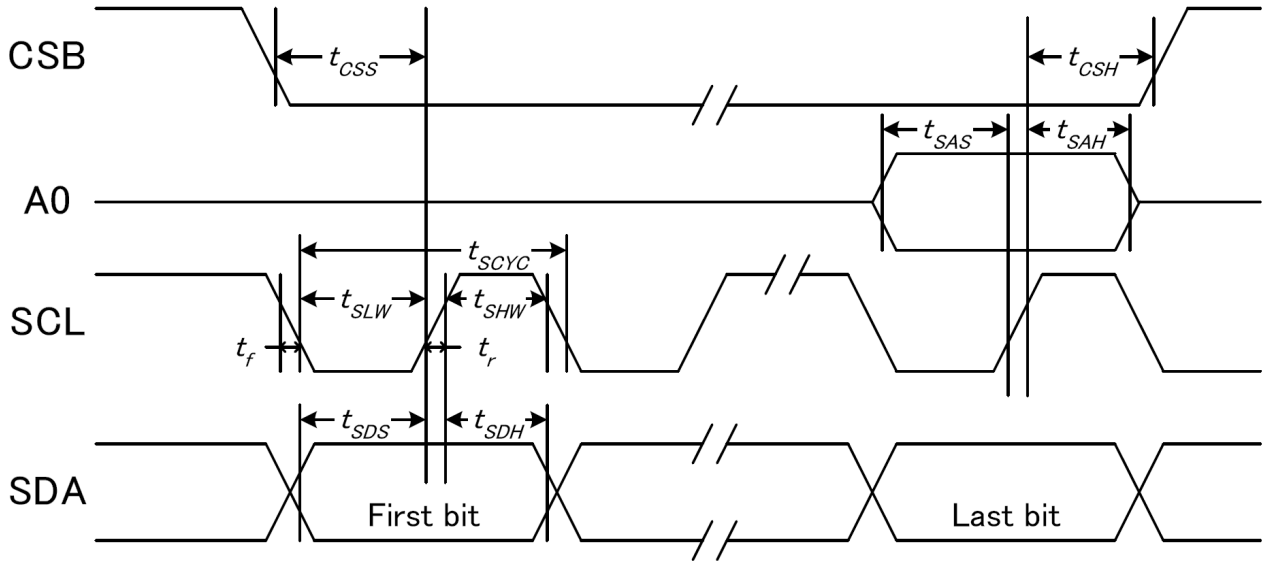


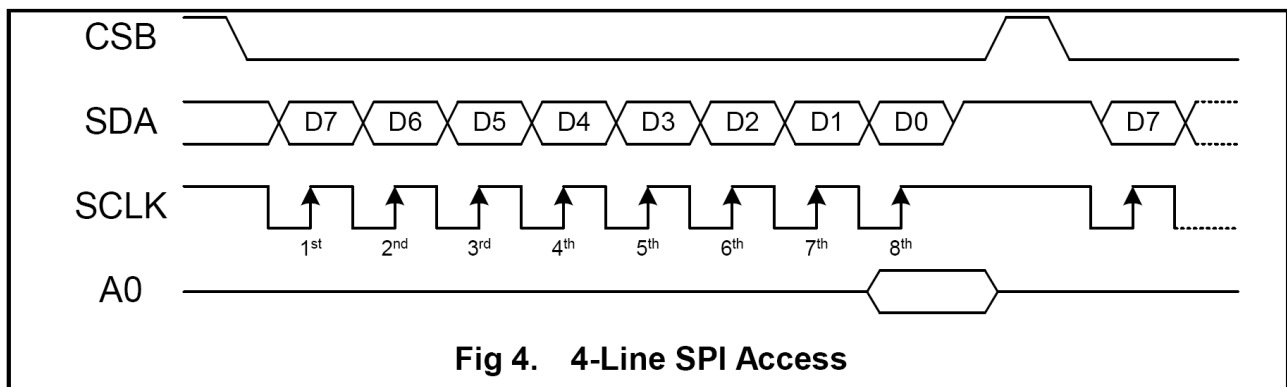
Fig 9. DDRAM and Output Map (COM/SEG)

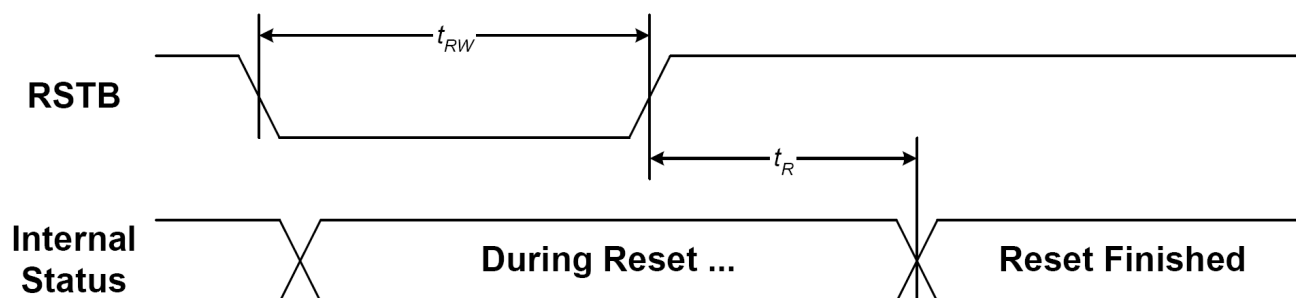
SERIAL INTERFACE CHARACTERISTICS**SERIAL INTERFACE TIMING CHARACTERISTICS**

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period	SCLK	tSCYC		50	—	ns
SCLK "H" pulse width		tSHW		25	—	
SCLK "L" pulse width		tSLW		25	—	
Address setup time	A0	tSAS		20	—	
Address hold time		tSAH		10	—	
Data setup time	SDA	tSDS		20	—	
Data hold time		tSDH		10	—	
CSB-SCLK time	CSB	tCSS		20	—	
CSB-SCLK time		tCSH		40	—	

*1 The input signal rise and fall time(t_r , t_f) are specified at 15 ns or less.

*2 All timing is specified using 20% and 80% of Vdd1 as the standard.

4-LINE SPI MODE DIAGRAM

RESET TIMING DIAGRAM**RESET TIMING**

Item	Symbol	Condition	Min.	Max.	Unit
Reset time	t_R		—	1.0	us
Reset "L" pulse width	t_{RW}		1.0	—	

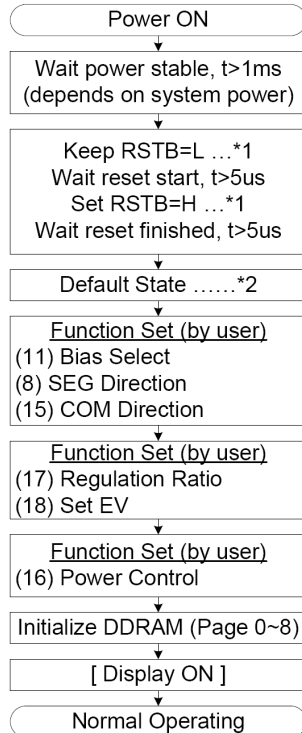
THE RESET CIRCUIT

Setting RSTB to "L" can initialize internal function. While RSTB is "L", no instruction except read status can be accepted. RSTB pin must connect to the reset pin of MPU and initialization by RSTB pin is essential before operating. Please note the hardware reset is not same as the software reset. When RSTB becomes "L", the hardware reset procedure will start. When RESET instruction is executed, the software reset procedure will start. The procedure is listed below:

Procedure	Hardware Reset	Software Reset
Display OFF: D=0, all SEGs/COMs output at VSS	V	X
Normal Display: INV=0, AP=0	V	X
SEG Normal Direction: MX=0	V	X
Clear Serial Counter and Shift Register (if using Serial Interface)	V	X
Bias Selection: BS=0	V	X
Booster Level BL=0	V	X
Exit Power Saving Mode	V	X
Power Control OFF: VB=0, VR=0, VF=0	V	X
Exit Read-modify-Write mode	V	V
Start Line S[5:0]=0	V	V
Column Address X[7:0]=0	V	V
Page Address Y[3:0]=0	V	V
COM Normal Direction: MY=0	V	V
V0 Regulation Ratio RR[2:0]=(1,0,0)	V	V
EV[5:0]=(1,0,0,0,0,0)	V	V
Exit Test Mode: TE=0	V	V

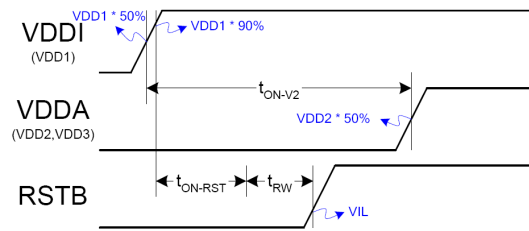
After power-on, RAM data are undefined and the display status is "Display OFF". It's better to initialize whole DDRAM (ex: fill all 00h or write the display pattern) before turning the Display ON. Besides, the power is not stable at the time that the power is just turned ON. A hardware reset is needed to initialize those internal registers after the power is stable.

INITIALIZING WITH THE BUILT-IN POWER SUPPLY CIRCUITS

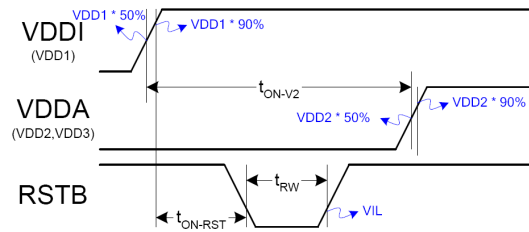


Arrange to execute all these procedures from releasing the reset state to setting the Power Control within 5ms. In case of other models, execute these procedures from turning ON the power to setting the Power Control in 5ms.*3

Case 1: RSTB=L while Power ON



Case 2: RSTB=H while Power ON



Note: The detailed description can be found in the respective sections listed below.

1. Please refer to the timing specification of t_{RW} and t_R .
2. Refer to Section RESET CIRCUIT.
3. The 5ms requirement depends on the characteristics of LCD panel and the external component of the power circuit. It is recommended to check with the real products with external component.
4. The detailed instruction functionality is described in Section 9. INSTRUCTION DESCRIPTION;
5. Power stable is defined as the time that the later power (VDDI or VDDA) reaches 90% of its rated voltage.

ELECTRO-OPTICAL CHARACTERISTICS

MEASURING CONDITION: POWER SUPPLY = $V_{OP} / 64 \text{ Hz}$
 TEMPERATURE = $23 \pm 5 \text{ }^{\circ}\text{C}$
 RELATIVE HUMIDITY = $60 \pm 20 \%$

ITEM	SYMBOL	UNIT	TYP. STN
RESPONSE TIME	Ton	ms	220
	Toff	ms	280
CONTRAST RATIO	Cr	-	12
VIEWING ANGLE (6 O'clock) $Cr \geq 2$	V3:00	°	40
	V6:00	°	70
	V9:00	°	40
	V12:00	°	50

THE ELECTRO-OPTICAL CHARACTERISTICS ARE MEASURED VALUE BUT NOT GUARANTEED ONES.

RELIABILITY OF LCD MODULE

ITEM	TEST CONDITION FOR NORMAL TEMPERATURE	TEST CONDITION FOR WIDE TEMPERATURE	TIME
High temperature operating	50°C	70°C	240 hours
Low temperature operating	0°C	-20°C	240 hours
High temperature storage	60°C	80°C	240 hours
Low temperature storage	-10°C	-30°C	240 hours
Temperature-humidity storage	40°C 90% R.H.	60°C 90% R.H.	96 hours
Temperature cycling	-10°C to 60°C 30 Min Dwell	-30°C to 80°C 30 Min Dwell	5 cycle
Vibration Test at LCM Level	Freq 10-55 Hz Sweep rate: 10-55-10 at 1 min Sweep mode Linear Displacement: 2 mm p-p 1 Hour each for X, Y, Z	Freq 10-55 Hz Sweep rate: 10-55-10 at 1 min Sweep mode Linear Displacement: 2 mm p-p 1 Hour each for X, Y, Z	—

SAMPLING METHOD

SAMPLING PLAN: ANSI/ASQ Z1.4

CLASS OF AQL: LEVEL II/ SINGLE SAMPLING
MAJOR-0.65% MINOR – 1.5%**QUALITY STANDARD**

DEFECT	CRITERIA	TYPE	FIGURE
SHORT CIRCUIT	-	MAJOR	-
MISSING SEGMENT	-	MAJOR	-
UNEVEN / POOR CONTRAST	-	MAJOR	-
CROSS TALK	-	MAJOR	-
PIN HOLE	$\text{MAX}(a,b) \leq 1 / 3 W$ DOT MATRIX: IF $0.6 \leq W$, $\text{MAX}(a,b) < 0.3 \text{ N.A.**}$ IF $0.4 \leq W < 0.6$ $\text{MAX}(a,b) < 0.25 \text{ N.A.**}$ IF $W < 0.4$, $\text{MAX}(a,b) < 0.2 \text{ N.A.**}$	MINOR	1
EXCESS SEGMENT	$\text{MAX}(c,d) \leq 1 / 3 T$	MINOR	1
BUBBLES	$d^* \geq 0.5$ QTY=0	MINOR	2
BLACKS SPOTS	$d \leq 0.6$ N.A.** $0.6 < d \leq 0.7$ QTY ≤ 2 $0.7 < d$ QTY=0	MINOR	2
LINE SCRATCHES	$x \geq 0.7$ $y \geq 0.05$ QTY=0	MINOR	3
BLACK LINE	$x \geq 0.7$ $y \geq 0.05$ QTY=0	MINOR	3

*d = MAX (d₁,d₂)

** N. A . = NOT APPLICABLE

DEFECT TABLE :

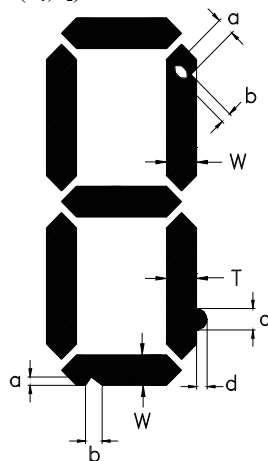
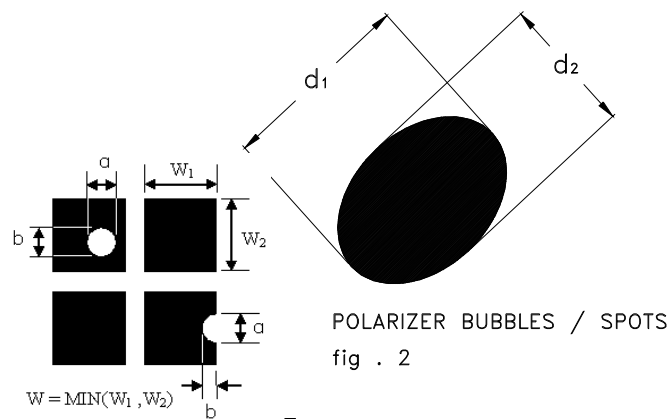


fig . 1

POLARIZER BUBBLES / SPOTS
fig . 2

LINE SCRATCHES / BLACK LINE

fig . 3

QUALITY STANDARD (CONT .)

DEFECT		CRITERIA	TYPE	FIGURE
CHIPS	CONTACT EDGE	$e \leq 1/2T$ $f \leq 1/3W$ $g \leq 3.5$	MINOR	4
	BOTTOM GLASS	$p \leq 1.0$ $q \leq 3.5$ $r \leq 1/2T$		4
	CORNER	$a \leq 1.5$ $b \leq W$		4
	TOP GLASS	$a \leq 3.0$ $b \leq 1/3T$ $c \leq 1/2W$		5
GLASS PROTRUSION		$a \leq 1/4 W$	MINOR	6
RAINBOW		-	MINOR	-

UNLESS STATE OTHERWISE , ALL UNIT ARE IN MILLIMETER .

DEFECT TABLE : B

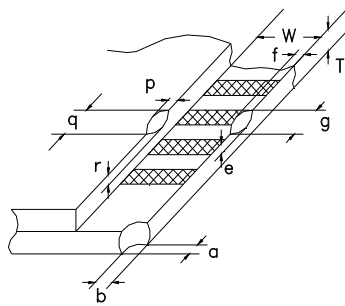


fig . 4

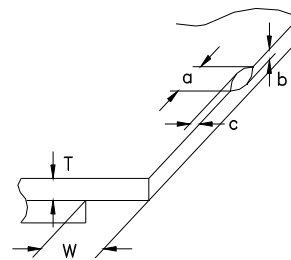


fig . 5

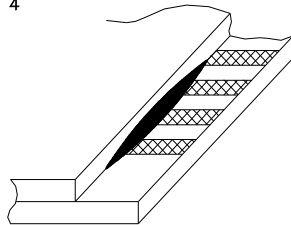


fig . 6

HANDLING PRECAUTIONS**(1) CAUTION OF LCD HANDLING & CLEANING**

The polarizing plate on the surface of the panel is made from organic substances. Be very careful for chemicals not to touch the plate or it leads the polarizing plate to deteriorate.

If the use of a chemical is unavoidable, wipe the panel lightly with soft materials, such as gauze and absorbent cotton, soaked in a solvent.

*Usable solvent: Alcohol (ethanol, IPA and the like)

*Appropriate solvent: Ketones, ethyl alcohol

Avoid wiping with a dry cloth, since it could damage the surface of the polarizing plate and others.

Do not expose to direct sunlight or fluorescent light for a long time

(2) CAUTION AGAINST STATIC CHARGE

The LCD modules use CMOS LSI drivers, so customers are recommended that any unused input terminal would be connected to V_{DD} or V_{SS} , do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

(3) ESD PRECAUTION

Inputs and outputs are protected against electrostatic discharge in normal handling. However, to be totally safe, it is recommended to take normal precautions appropriate to handling LCM module. For example: product surface grounding. Always take ESD precaution when handling the *LCD Module*. Components are exposed for direct finger touches and can be damaged unless ESD precaution is taken.

(4) PACKAGING

Avoid intense shock and falls from a height and do not operate or store them exposed to direct sunshine or high temperature/humidity for long periods.

(5) CAUTION FOR OPERATION

The viewing angle can be adjusted by varying the LCD driving voltage V_O .

Driving voltage should be kept within specified range, excess voltage shortens display life.

Response time increases with decrease in temperature.

Display may turn black or dark Blue at temperature above its operational range; this is however not destructive and the display will return to normal once the temperature falls back to range.

Mechanical disturbance during operation (such as pressing on the viewing area) may cause the segments to appear "fractured". They will recover once the display is turned off.

Condensation at terminals will cause malfunction and possible electrochemical reaction. Relative humidity of the environment should therefore be kept below 60%.

(6) SAFETY

Liquid crystal may leak out of a damaged LCD, it is recommended to wash off the liquid crystal by using solvents such as acetone or ethanol and should be burned up later.

If any liquid leak out of a damaged glass cell comes in contact with your hands, wash it off with soap and water immediately.

WARRANTY

CLOVER will replace or repair any of her LCD module in accordance with her LCD specification for a period of one year from date of shipment. The warranty liability of Clover is limited to repair and/or replacement. Clover will not be responsible for any subsequent or consequential event.

SPECIFICATION REVISION RECORD

Revision No.	Description	Date(DD/MM/YY)
00	1 st Issue	22/10/21