

KOE

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Kaohsiung Opto-Electronics Inc.

FOR MESSRS : _____

DATE : May 1st, 2012

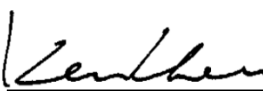
CUSTOMER'S ACCEPTANCE SPECIFICATIONS

TX09D04VM3CAA

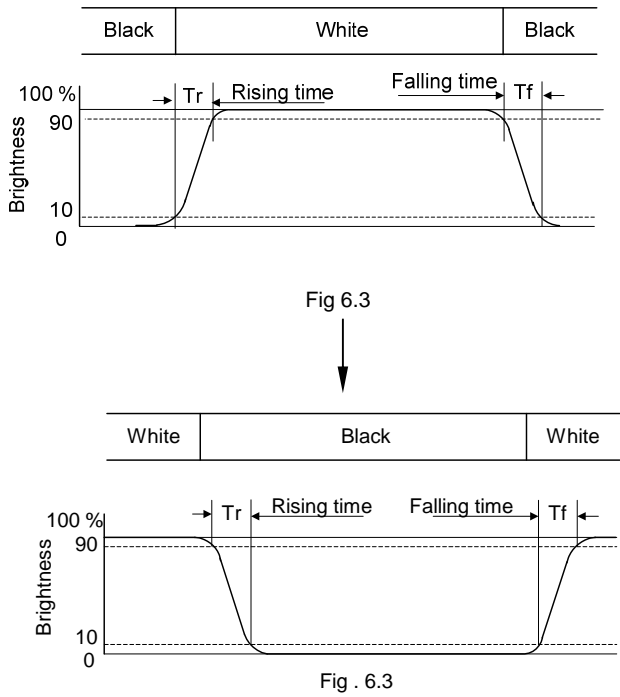
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ACCEPTED BY: _____

PROPOSED BY: 

2. RECORD OF REVISION

DATE	SHEET No.	SUMMARY
Mar.22,'11	7B64PS 2703 – TX09D04VM3CAA-2 Page 3 - 1/1	3.1 DISPLAY FEATURES Revised : LCD Type : Normally Black → Normally White
	7B64PS 2706 – TX09D04VM3CAA-2 Page 6 - 2/2	6. OPTICAL CHARACTERISTICS Revised : Note 4  <p>Fig 6.3</p>
	7B64PS 2709 – TX09D04VM3CAA-2 Page 9 - 4/5	9.4 POWER SEQUENCE Added : Note 3
	7B64PS 2710 – TX09D04VM3CAA-2 Page 10 - 1/2~2/2	10. OUTLINE DIMENSIONS Redrew the outline dimensions.
May 01,'12	All pages	COMPANY NAME CHANGED: KAOHSIUNG HITACHI ELECTRONICS CO.,LTD. ↓ KAOHSIUNG OPTO-ELECTRONICS INC.
	7B64PS 2704 – TX09D04VM3CAA-3 Page 4 - 1/1	4. ABSOLUTE MAXIMUM RATINGS Revised : Note2
	7B64PS 2705 – TX09D04VM3CAA-3 Page 5 - 1/1	5.2 BACKLIGHT CHARACTERISTICS Added : LED Lifetime & Note3
	7B64PS 2708 – TX09D04VM3CAA-3 Page 8 - 1/1	8. RELIABILITY TESTS Changed: Test Condition Upgraded

3. GENERAL DATA

3.1 DISPLAY FEATURES

This module is a 3.5" QVGA TFT with 4 by 3 format, which is composed of amorphous silicon. Each sub-pixel (dot) on the LCD is vertical stripe type arranged as R (red), G (green), B (blue) color sequentially. The bounding technology, COG (chip on glass), and LED backlight design have been applied on this display RoHS compliant.

Part Name	TX09D04VM3CAA
Module Dimensions	85.9(W) mm x 71.7(H) mm x 13.9(D) mm typ.
LCD Active Area	71.04(W) mm x 53.28(H) mm
Pixel Pitch	0.222(W) mm x 0.222 (H) mm
Resolution	320 x 3(RGB)(W) x 240(H) dots
Color Pixel Arrangement	R, G, B Vertical stripe
LCD Type	Transmissive Color TFT; Normally White
Display Type	Active Matrix
Number of Colors	262k Colors (R.G.B 6bits digital each)
Backlight	Light Emitting Diode (LED) x 4
Weight	85 g (typ.)
Interface	C-MOS; 18-bit RGB; 40 pins
Power Supply Voltage	3.3V for LCD; 5.0V for backlight
Power Consumption	0.43W for LCD; 1.15W for backlight
Viewing Direction	3 O'clock (No inversion of gray level scale and less change in brightness)

4. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit	Remarks
Supply Voltage	VDD	0	4.0	V	-
Input Voltage of Logic	VI	-0.3	VDD+0.3	V	Note 1
Operating Temperature	Top	-30	80	°C	Note 2
Storage Temperature	Tst	-40	90	°C	Note 2
Backlight Input Voltage	VLED	-	6.0	V	-

Note 1: The rating is defined for the signal voltages of the interface such as DE, DCLK and RGB data bus.

Note 2: The maximum rating is defined as above based on the chamber temperature, which might be different from ambient temperature after assembling the panel into the application. Moreover, some temperature-related phenomenon as below needed to be noticed:

- Background color, contrast and response time would be different in temperatures other than 25°C.
- Operating under high temperature will shorten LED lifetime.

5. ELECTRICAL CHARACTERISTICS

5.1 LCD CHARACTERISTICS

Ta=25°C, VSS=0V

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks
Power Supply Voltage	VDD	-	3.0	3.3	3.6	V	-
Input Voltage of Logic	VI	"H" level	2.5	-	3.6	V	Note 1
		"L" level	-0.3	-	0.8		
Power Supply Current	IDD	VDD=3.3V	-	130	300	mA	Note 2
Vsync Frequency	f_v	-	-	60	68	Hz	-
Hsync Frequency	f_H	-	15.6	15.7	20.4	KHz	-
DCLK Frequency	f_{CLK}	-	6.40	6.67	8.89	MHz	-

Note 1: The rating is defined for the signal voltages of the interface such as DTMG, DCLK and RGB data bus.

Note 2: An all black check pattern is used when measuring IDD. f_v is set to 60 Hz.

Note 3: 1.0A fuse is applied in the module for IDD. For display activation and protection purpose, power supply is recommended larger than 2.5A to start the display and break fuse once any short circuit occurred.

5.2 BACKLIGHT CHARACTERISTICS

Ta=25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks
LED Input Voltage	VLED	-	4.5	5.0	5.5	V	Note1
LED Forward Current (DIM control)	ILED	VLED = 5V	-	230	300	mA	Note 2
LED Lifetime	-	230mA	-	70K	-	hrs	Note 3

Note 1: Fig. 5.1 shows the LED backlight circuit.

Note 2: Dimming function can be obtained by applying DC voltage (0 ~ 3.3V) or PWM (duty 0% ~ 100%) signal from the display interface CN1. The recommended PWM signal is 100 ~ 300 Hz with 3.3V amplitude.

Note 3: The estimated lifetime is specified as the time to reduce 50% brightness by applying 230 mA at 25°C.

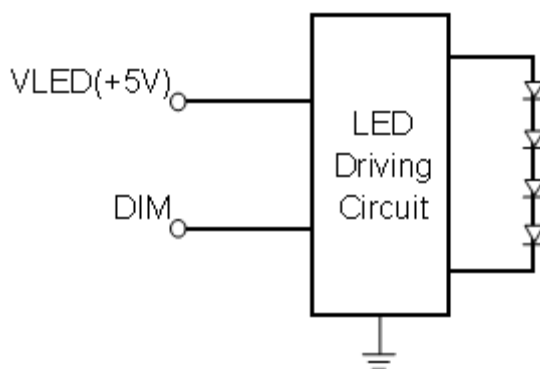


Fig. 5.1

6. OPTICAL CHARACTERISTICS

The optical characteristics are measured based on the conditions as below:

- Supplying the signals and voltages defined in the section of electrical characteristics.
- The backlight unit needs to be turned on after 30 minutes.
- The ambient temperature is 25°C.
- In the dark room around 500~1000 lx, the equipment has been set for the measurements as shown in Fig 6.1.

$$T_a=25^{\circ}\text{C}, f_v=60\text{Hz}, V_{CC}=3.3\text{V}$$

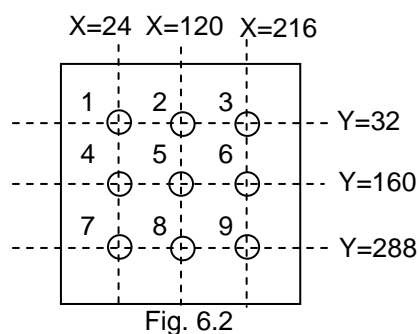
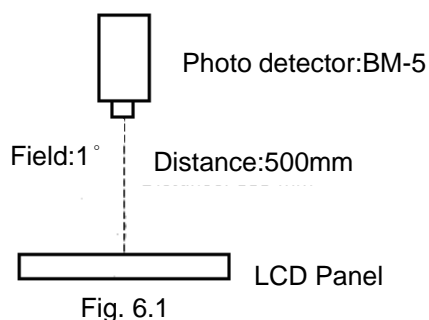
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks
Brightness of White		B	$\phi=0^{\circ}, \theta=0^{\circ}$ ILED= 230 mA	300	400	-	cd/m ²	Note 1
Brightness Uniformity		-		70	-	-	%	Note 2
Contrast Ratio		CR		-	600	-	-	Note 3
Response Time		Rise(Ton)	$\phi=0^{\circ}, \theta=0$	-	15	-	ms	Note 4
		Fall(Toff)		-	10	-		
Viewing Angle		$\theta=X$	$\phi=0^{\circ}, CR \geq 10$	45	60	-	Degree	Note 5
		$\theta=X'$	$\phi=180^{\circ}, CR \geq 10$	45	60	-		
		$\theta=Y$	$\phi=90^{\circ}, CR \geq 10$	55	70	-		
		$\theta=Y'$	$\phi=270^{\circ}, CR \geq 10$	55	70	-		
Color Chromaticity	Red	X	$\phi=0^{\circ}, \theta=0$	0.571	0.601	0.631	-	Note 6
		Y		0.323	0.353	0.383		
	Green	X		0.303	0.343	0.383		
		Y		0.556	0.596	0.636		
	Blue	X		0.104	0.144	0.184		
		Y		0.068	0.108	0.148		
	White	X		0.262	0.302	0.342		
		Y		0.284	0.324	0.364		

Note 1: The brightness is measured from the center point of the panel, P5 in Fig. 6.2, for the typical value.

Note 2: The brightness uniformity is calculated by the equation as below:

$$\text{Brightness uniformity} = \frac{\text{Min. Brightness}}{\text{Max. Brightness}} \times 100\%$$

, which is based on the brightness values of the 9 points measured by BM-5 as shown in Fig. 6.2.



Note 3: The Contrast Ratio is measured from the center point of the panel, P5, and defined as the following equation:

$$CR = \frac{\text{Brightness of White}}{\text{Brightness of Black}}$$

Note 4: The definition of response time is shown in Fig. 6.3. Rising time is the period from 90% brightness down to 10% brightness when the data is from white turning to black. Oppositely, Falling time is the period from 10% brightness rising to 90% brightness.

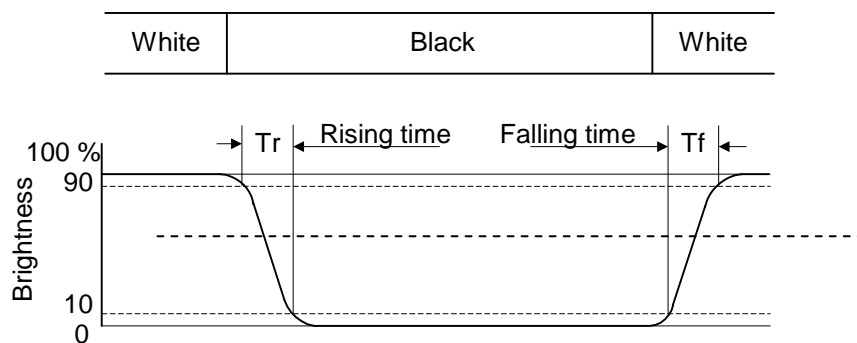


Fig . 6.3

Note 5: The definition of viewing angle is shown in Fig. 6.4. Angle ϕ is used to represent viewing directions, for instance, $\phi=270^\circ$ means 6 o'clock, and $\phi=0^\circ$ means 3 o'clock. Moreover, angle θ is used to represent viewing angles from axis Z toward plane XY.

The viewing direction of this display is 6 o'clock, which means that a photograph with gray scale would not be reversed in color and the brightness change would be less from this direction. However, the contrast peak would be located at 12 o'clock.

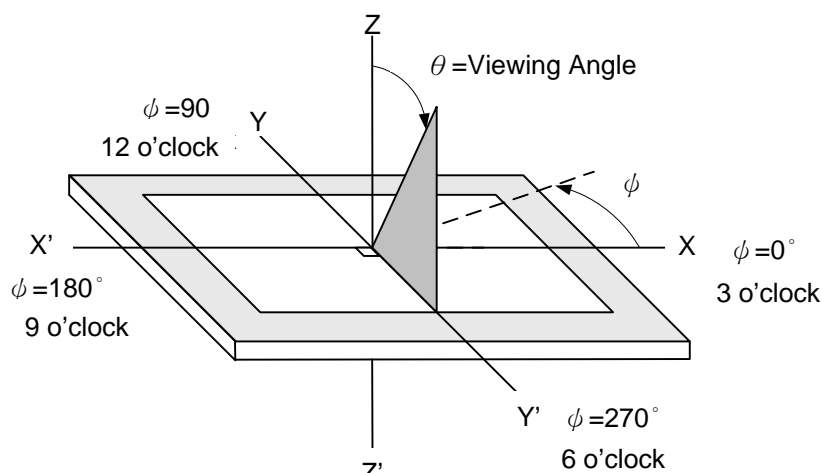
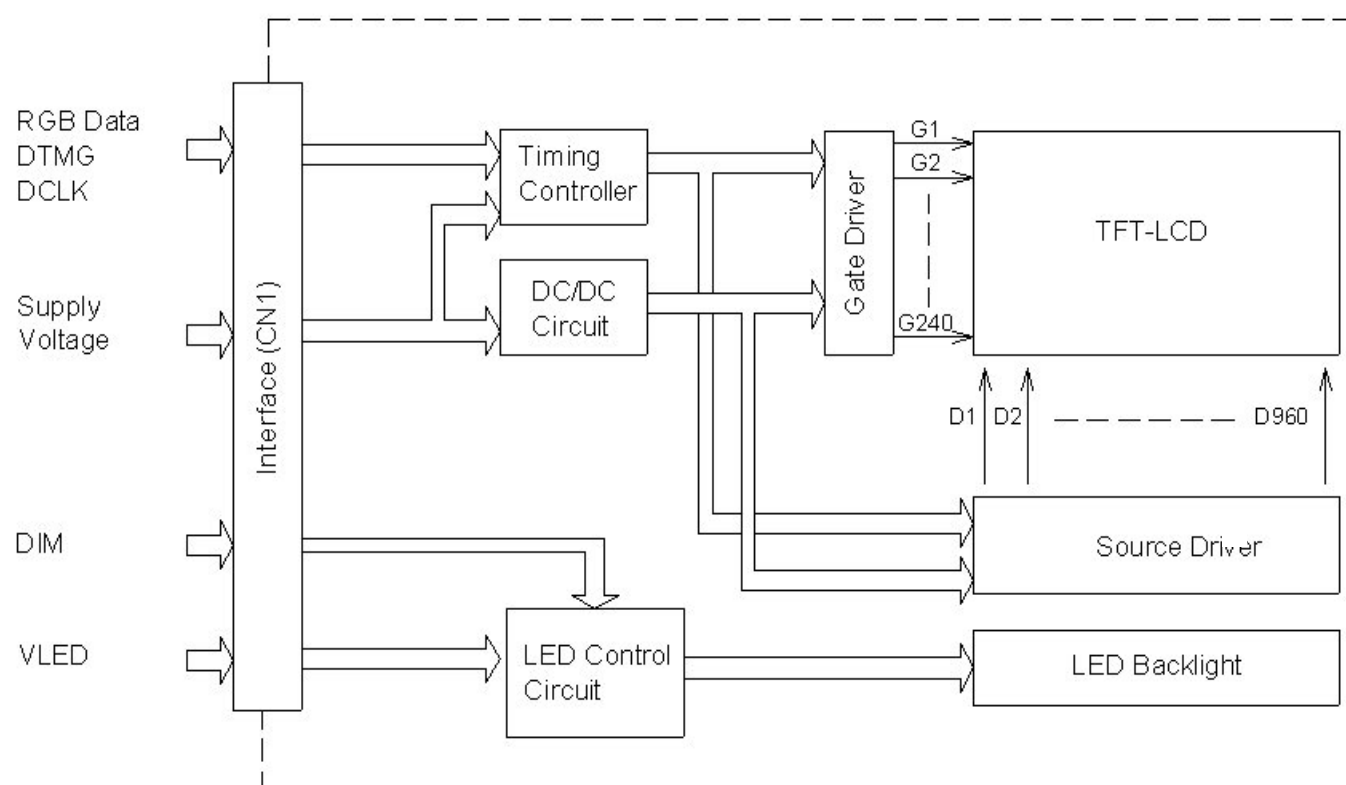


Fig. 6.4

Note 6: The color chromaticity is measured from the center point of the panel, P5, as shown in Fig. 6.2.

7. BLOCK DIAGRAM



8. RELIABILITY TESTS

Test Item	Condition	
High Temperature	1) Operating 2) 80 °C	500 hrs
Low Temperature	1) Operating 2) -30 °C	500 hrs
High Temperature	1) Storage 2) 90 °C	500 hrs
Low Temperature	1) Storage 2) -40 °C	500 hrs
Heat Cycle	1) Operating 2) -30 °C ~80 °C	3) 3hrs~1hr~3hrs 500 hrs
Thermal Shock	1) Non-Operating 2) -35 °C ↔ 85 °C	3) 0.5 hr ↔ 0.5 hr 500 hrs
High Temperature & Humidity	1) Operating 2) 40 °C & 85%RH	3) Without condensation (Note3) 500 hrs
Vibration	1) Non-Operating 2) 10~200 Hz	3) 5G 4) X, Y, and Z directions 1 hr for each direction
Mechanical Shock	1) Non-Operating 2) 10 ms	3) 80G 4) ±X, ±Y and ±Z directions Once for each direction
ESD	1) Operating 2) Tip:150 pF,330 Ω 3) Air discharge for glass: ± 12KV 4) Contact discharge for metal frame: ± 15KV	1) Glass: 9 points 2) Metal frame: 8 points (Note4)
Restart Test	1) Test period 0.5S(on)→0.5S(off)→0.5S(on) for 5 times 2) Repeat 1) every 5 min. later for 5 times	Operating for 1hr @ 80 °C
		Operating for 1hr @ -30 °C

Note 1: Display functionalities are inspected under the conditions defined in the specification after the reliability tests.

Note 2: The display is not guaranteed for use in corrosive gas environments.

Note 3: Under the condition of high temperature & humidity, if the temperature is higher than 40 °C, the humidity needs to be reduced as Fig. 8.1 shown.

Note 4: All pins of LCD interface(CN1) have been tested by ±100V contact discharge of ESD under non-operating condition.

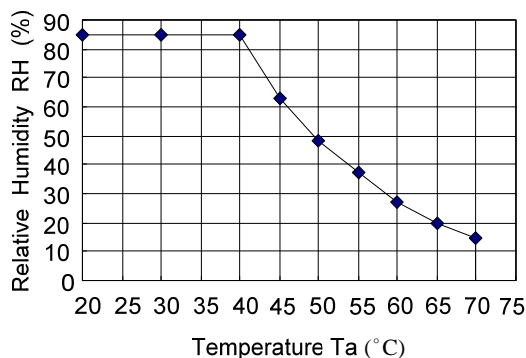


Fig. 8.1

9. LCD INTERFACE

9.1 INTERFACE PIN CONNECTIONS

The connector of display interface is IMSA-9617S-40A-TB made by IRISO and more details of the connector are shown in the section of outline dimensions.

Pin assignment of LCD interface is as below:

Pin No.	Signal	Function	Pin No.	Signal	Function
1	NC	No Connection	21	R3	Red 3
2	DTMG	Data Enable	22	R2	Red 2
3	HREV	Normal Scan : Low or Open; Reverse Scan : High	23	R1	Red 1
			24	R0	Red 0 (LSB)
4	B5	Blue 5 (MSB)	25	VREV	Normal Scan : Low or Open; Reverse Scan : High
5	B4	Blue 4			
6	B3	Blue 3	26	NC	No Connection
7	B2	Blue 2	27	NC	
8	B1	Blue 1	28	VSS	GND(0V)
9	B0	Blue 0 (LSB)	29	DCLK	Dot Clock
10	VDD	Power Supply (+3.3V)	30	VSS	GND(0V)
11	VDD		31	VSS	
12	G5	Green 5 (MSB)	32	VSS	
13	G4	Green 4	33	VSS	
14	G3	Green 3	34	VSS	
15	G2	Green 2	35	NC	No Connection
16	G1	Green 1	36	VSS	GND(0V)
17	G0	Green 0 (LSB)	37	DIM	Brightness Control
18	VSS	GND(0V)	38	NC	No Connection
19	R5	Red 5 (MSB)	39	VLED	Power supply (+5.0V) for Backlight
20	R4	Red 4	40	VLED	

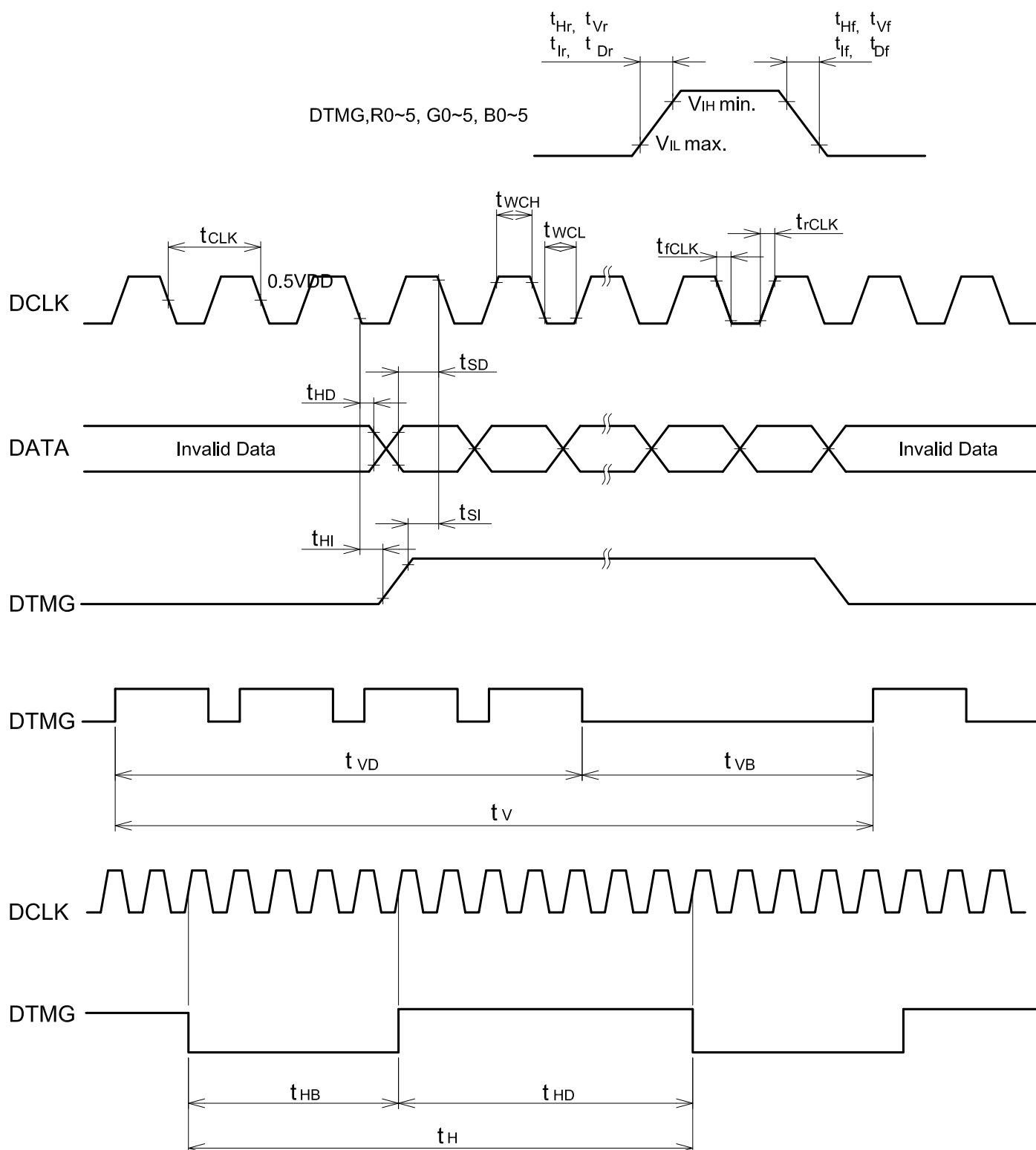
Notes 1: All VDD pins shall be connected to +3.3V (typ.).

Notes 2: All VSS pins shall be grounded.

Notes 3: All VLED pins shall be connected to +5.0V (typ.).

9.2 TIMING CHART

DTMG (Data Enable) is the signal to determine valid data, and the timing of DTMG can be determined from Hsync and Vsync as below. For this display, only DTMG and DCLK are the essential signals. Hsync and Vsync are not necessary to connect to display interface after DTMG has been generated and input.



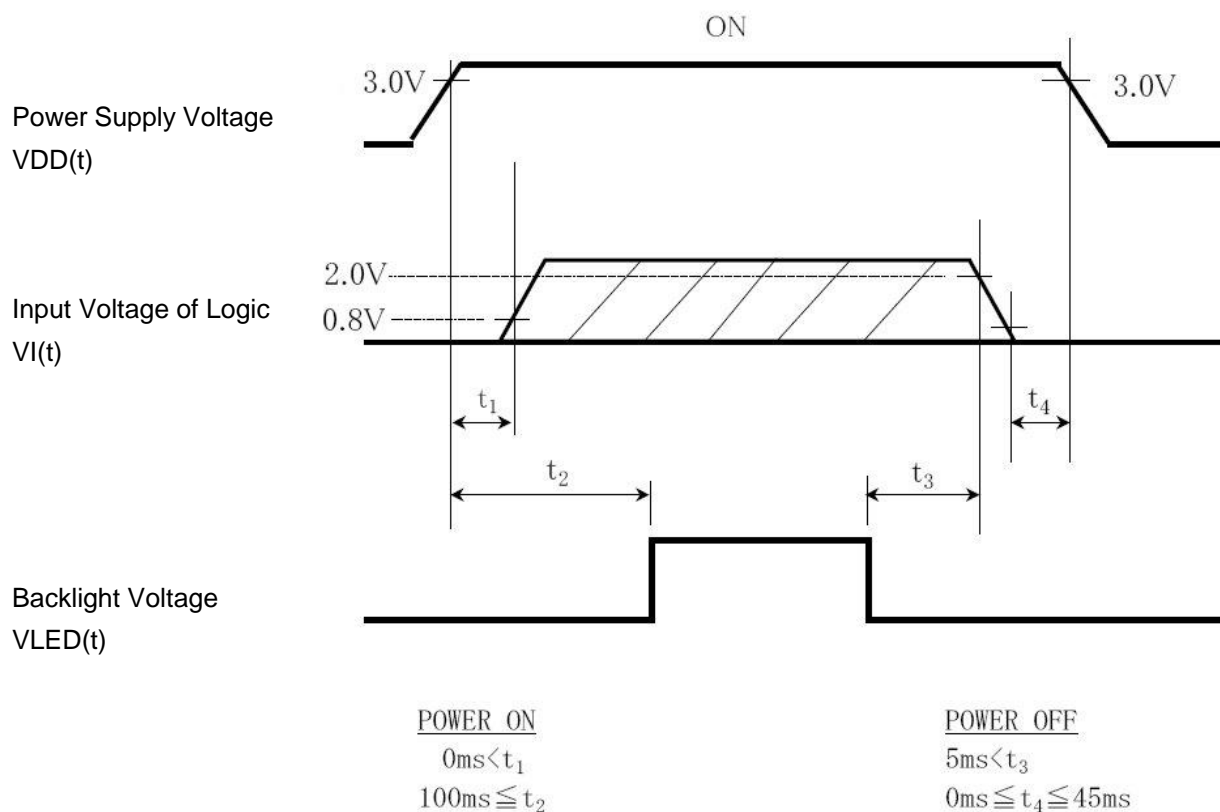
Data is latched by DCLK'S falling edge.

9.3 INTERFACE TIMING SPECIFICATIONS

The column of timing sets including minimum, typical, and maximum as below are based on the best optical performance, frame frequency (Vsync) = 60 Hz to define. If 60 Hz is not the aim to set, less than 68 Hz for Vsync is recommended to apply for better performance by other parameter combination as the definitions in section 5.1.

Item		Symbol	Min.	Typ.	Max.	Unit
DCLK	Cycle time	$1 / t_{CLK}$	6.40	6.67	8.89	MHz
	Low level Width	t_{WCL}	7	-	-	ns
	High level Width	t_{WCH}	7	-	-	
	Rise time / Fill time	t_{rCLK}, t_{fCLK}	-	-	4	
	Duty	D	0.35	0.50	0.65	-
DTMG	Set up time	t_{SI}	5	-	-	ns
	Hold time	t_{HI}	4	-	-	
	Rise/Fall time	t_{Ir}, t_{If}	-	-	4	ns
	Horizontal Cycle	t_H	410	424	436	t_{CLK}
	Horizontal Valid Data width	t_{HD}	320	320	320	
	Horizontal porch width	t_{HB}	90	104	116	
	Vertical Cycle	t_V	260	262	340	t_H
	Vertical Valid Data width	t_{VD}	240	240	240	
	Vertical porch width	t_{VB}	20	22	100	
Data	Set up time	t_{SD}	5	-	-	ns
	Hold time	t_{HD}	4	-	-	
	Rise/Fall time	t_{Dr}, t_{Df}	-	-	4	

9.4 POWER SEQUENCE

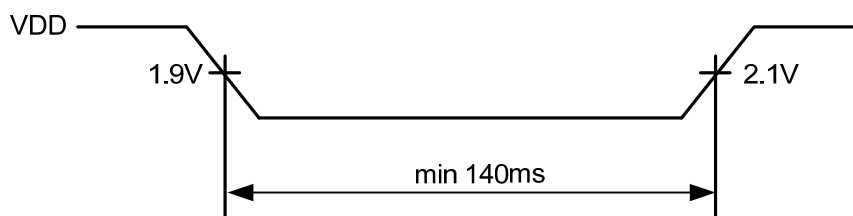


Note 1: Set $0\text{V} \leq V_I(t) \leq V_{DD}(t)$

Here, $V_I(t)$, $V_{DD}(t)$ indicate the transitional state of V_I , V_{DD} when power supply is turned ON or OFF.

Note 2: Do not keep interface signal high-impedance when power on.

Note 3: When 3.5" TFT module is re-powered on after short time power off, the following VDD voltage levels and off time are recommended under $V_{DD}=3.3\text{V}$ and at $T_a=25^\circ\text{C}$.



9.5 DATA INPUT for DISPLAY COLOR

	COLOR & Gray Scale	Data Signal																	
		R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5	R5
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (63)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Green (63)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	Red (62)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red (63)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	Green (62)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green (63)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue (62)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

9.6 SCAN DIRECTION

Scan direction is available to be switched as below by setting CN1's U/D and L/R pins.



Fig. 9.8 Normal Scan (U/D: Low; L/R: Low)

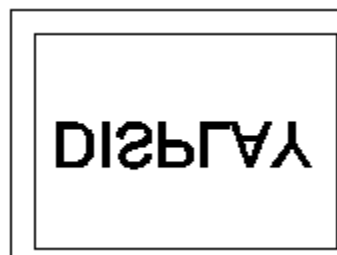


Fig. 9.9 Vertical reverse (U/D: High; L/R: Low)



Fig. 9.10 Horizontal reverse (U/D: Low; L/R: High)

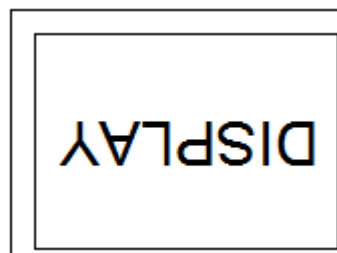
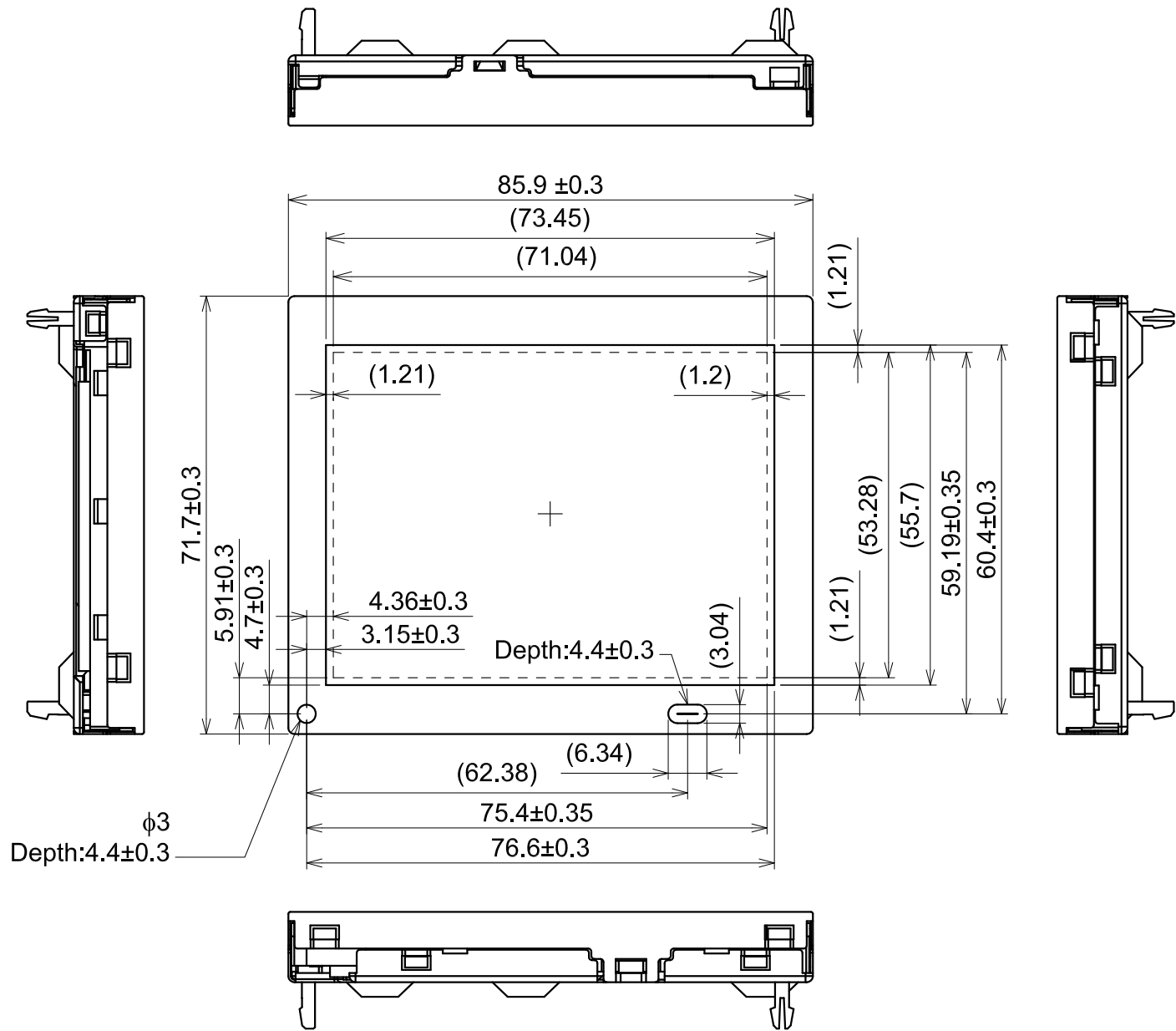


Fig. 9.11 Rotation of 180 degree (U/D: High; L/R: High)

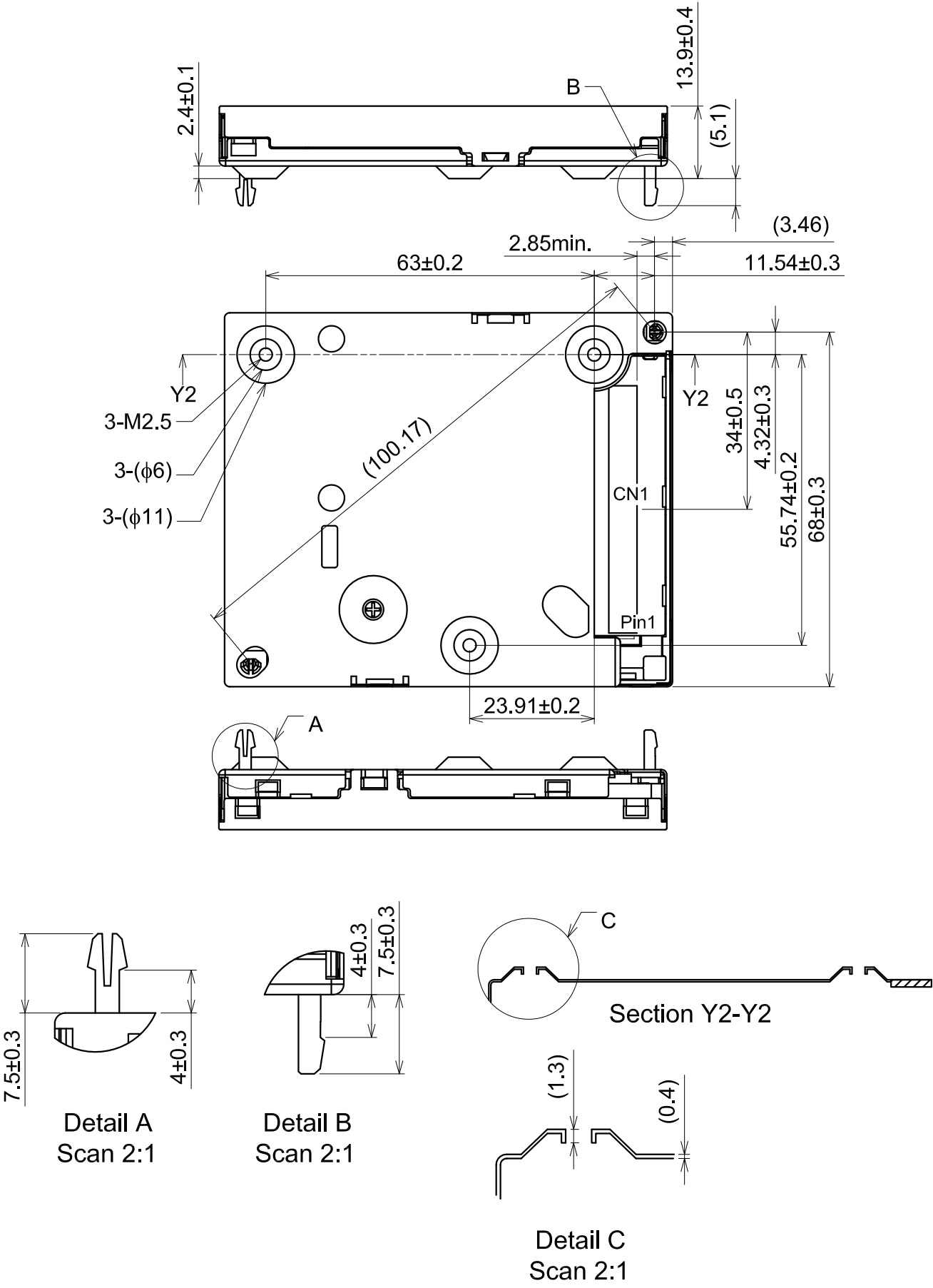
10. OUTLINE DIMENSIONS

10.1 FRONT VIEW



Scale : NTS
Unit : mm

10.2 REAR VIEW



Scale : NTS
Unit : mm

11. APPEARANCE STANDARD

The appearance inspection is performed in a dark room around 500~1000 lx based on the conditions as below:

- The distance between inspector's eyes and display is 30 cm.
- The viewing zone is defined with angle θ shown in Fig. 11.1 The inspection should be performed within 45° when display is shut down. The inspection should be performed within 5° when display is power on.

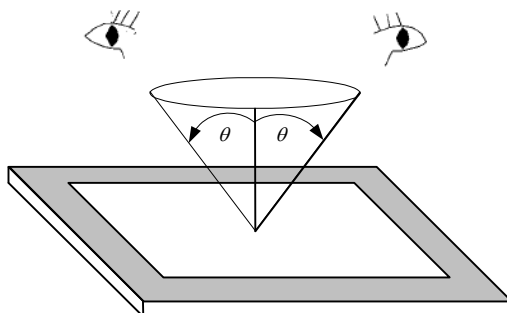


Fig. 11.1

11.1 THE DEFINITION OF LCD ZONE

LCD panel is divided into 3 areas as shown in Fig.11.2 for appearance specification in next section. A zone is the LCD active area (dot area); B zone is the area, which extended 1 mm out from LCD active area; C zone is the area between B zone and metal frame.

In terms of housing design, B zone is the recommended window area customers' housing should be located in.

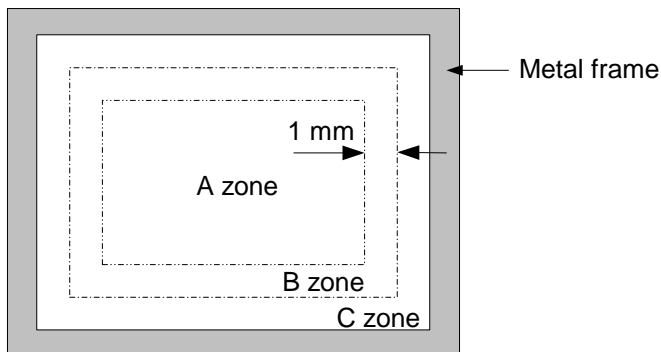


Fig. 11.2

11.2 LCD APPEARANCE SPECIFICATION

The specification as below is defined as the amount of unexpected phenomenon or material in different zones of LCD panel. The definitions of length, width and average diameter using in the table are shown in Fig. 11.3 and Fig. 11.4.

No.	ITEM	CRITERIA			APPLIED ZONE	
L C D	Scratches	Length L(mm)	Width W(mm)	Maximum number acceptable	A,B	
		$L \leq 2.0$	$W \leq 0.03$	ignored		
		$L \leq 2.0$	$0.03 < W \leq 0.05$	4		
		$L > 2.0$	$0.05 < W$	none		
	Dent	Distinguished one is acceptable			A	
	Bubbles	Average diameter D(mm)		Maximum number acceptable	A	
		$D \leq 0.3$		2		
		$0.3 < D$		none		
	Stains Foreign Materials Dark spot	Filamentous (Line shape)			A,B	
		Length L(mm)	Width W(mm)	Maximum number acceptable		
		$L < 2.0$	$W \leq 0.05$	4		
		$L \leq 1.0$	$0.05 < W \leq 0.1$	2		
		Round(Dot shape)			A,B	
		Average diameter D(mm)		Maximum number acceptable		
		$D \leq 0.15$		6		
		$0.15 < D \leq 0.2$		4		
		$0.2 < D$		none		
		The total number		Filamentous + Round=9		
		Those wiped out easily are acceptable				
		Dot Defect			Maximum number acceptable	A , B
			Sparkle mode	1 dot	4	
				2 dots	2(sets)	
	Total			4		
	Black mode		1 dot	4		
			2 dots	2(sets)		
			Total	4		
	Sparkle mode & Black mode		2 dots	2(sets)		
	Total		6			

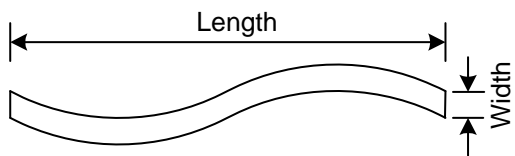
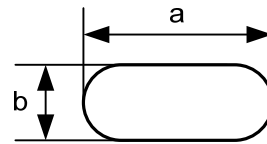


Fig. 11.3



$$\text{Average diameter} = \frac{a + b}{2}$$

Fig. 11.4

Note 1: The definitions of dot defect are as below:

- The defect area of the dot must be bigger than half of a dot.
- For bright dot-defect, showing black pattern, the dot's brightness must be over 30% brighter than others.
- For dark dot-defect, showing white pattern, the dot's brightness must be under 70% darker than others.
- The definition of 1-dot-defect is the defect-dot, which is isolated and no adjacent defect-dot.
- The definition of adjacent dot is shown as Fig. 11.5.

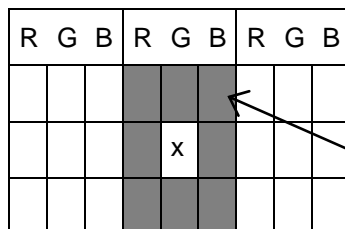


Fig 11.5

The dots colored in gray are adjacent to defect - dot "X".

12. PRECAUTIONS

12.1 PRECAUTIONS of ESD

- 1) Before handling the display, please ensure your body has been connected to ground to avoid any damages by ESD. Also, do not touch display's interface directly when assembling.
- 1) Please remove the protection film very slowly before turning on the display to avoid generating ESD.

12.2 PRECAUTIONS of HANDLING

- 1) In order to keep the appearance of display in good condition, please do not rub any surfaces of the displays by using sharp tools harder than 3H, especially touch panel, metal frame and polarizer.
- 2) Please do not stack the displays as this may damage the surface. In order to avoid any injuries, please avoid touching the edge of the glass or metal frame and wore gloves during handling.
- 2) Touching the polarizer or terminal pins with bare hand should be avoided to prevent staining and poor electrical contact.
- 3) Do not use any harmful chemicals such as acetone, toluene, and isopropyl alcohol to clean display's surfaces.
- 4) Please use soft cloth or absorbent cotton with ethanol to clean the display by gently wiping. Moreover, when wiping the display, please wipe it by horizontal or vertical direction instead of circling to prevent leaving scars on the display's surface, especially polarizer.
- 5) Please wipe any unknown liquids immediately such as saliva, water or dew on the display to avoid color fading or any permanent damages.
- 6) Maximum pressure to the surface of the display must be less than 1.96×10^4 Pa. If the area of applied pressure is less than 1 cm^2 , the maximum pressure must be less than 1.96N.

12.3 PRECAUTIONS OF OPERATING

- 1) Please input signals and voltages to the displays according to the values defined in the section of electrical characteristics to obtain the best performance. Any voltages over than absolute maximum rating will cause permanent damages to this display. Also, any timing of the signals out of this specification would cause unexpected performance.
- 2) When the display is operating at significant low temperature, the response time will be slower than it at 25°C . In high temperature, the color will be slightly dark and blue compared to original pattern. However, these are temperature-related phenomenon of LCD and it will not cause permanent damages to the display when used within the operating temperature.
- 3) The use of screen saver or sleep mode is recommended when static images are likely for long periods of time. This is to avoid the possibility of image sticking.
- 4) Spike noise can cause malfunction of the circuit. The recommended limitation of spike noise is no bigger than $\pm 100 \text{ mV}$.

12.4 PRECAUTIONS of STORAGE

If the displays are going to be stored for years, please be aware the following notices.

- 1) Please store the displays in a dark room to avoid any damages from sunlight and other sources of UV light.
- 2) The recommended long term storage temperature is between 10 C° ~35 C° and 55%~75% humidity to avoid causing bubbles between polarizer and LCD glasses, and polarizer peeling from LCD glasses.
- 3) It would be better to keep the displays in the container, which is shipped from Hitachi, and do not unpack it.
- 4) Please do not stick any labels on the display surface for a long time, especially on the polarizer.

13.DESIGNATION OF LOT MARK

13.1 LOT MARK

Lot mark is consisted of 4 digits for production lot and 6 digits for production control.

