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<i>Elvis Wu</i>		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :  
ET050013DDBA  
 (RoHS)  
 FOR MESSRS :  
 \_\_\_\_\_

CUSTOMER'S APPROVAL

DATE :

\_\_\_\_\_

BY :

\_\_\_\_\_

EMERGING DISPLAY  
TECHNOLOGIES CORPORATION

MODEL NO.	VERSION	PAGE
ET050013DDBA	1	0-1

RECORDS OF REVISION

DOC . FIRST ISSUE

JAN.10, 2025

DATE	REVISED PAGE NO.	SUMMARY
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1. GENERAL SPECIFICATIONS

1.1 DATA SHEETS FOR CONTROLLER/DRIVER  
PLEASE REFER TO :

SITRONIX ST7265

1.2 MATERIAL SAFETY DESCRIPTION

ASSEMBLIES SHALL COMPLY WITH EUROPEAN ROHS REQUIREMENTS, INCLUDING PROHIBITED MATERIALS/COMPONENTS CONTAINING LEAD, MERCURY, CADMIUM, HEXAVALENT CHROMIUM, POLYBROMINATED BIPHENYLS (PBB) AND POLYBROMINATED DIPHENYL ETHERS (PBDE), BIS(2-ETHYLHEXYL) PHTHALATE (DEHP), BUTYL BENZYL PHTHALATE (BBP), DIBUTYL PHTHALATE (DBP), DIISOBUTYL PHTHALATE (DIBP).

2. MECHANICAL SPECIFICATIONS

( 1 ) DIAGONALS	-----	5.0 inch
( 2 ) NUMBER OF DOTS	-----	800(RGB)W * 480H DOTS
( 3 ) MODULE SIZE	-----	120.7W * 75.8H * 2.85D mm (NOT INCLUDED FPC)
( 4 ) VIEWING AREA	-----	109.7W * 66.4H mm
( 5 ) ACTIVE AREA	-----	108W * 64.8H mm
( 6 ) DOT SIZE	-----	0.045W * 0.135H mm
( 7 ) PIXEL SIZE	-----	0.135W * 0.135H mm
( 8 ) LCD TYPE	-----	TFT, IPS, TRANSMISSIVE, NORMALLY BLACK
( 9 ) COLOR	-----	16.7M
( 10 ) VIEWING DIRECTION	-----	SUPER WIDE VIEW
( 11 ) BACKLIGHT	-----	LED, COLOR : WHITE
( 12 ) INTERFACE MODE	-----	RGB 24 BIT PARALLEL (DE/SYNC MODE)
( 13 ) WEIGHT	-----	53g

### 3. ABSOLUTE MAXIMUM RATINGS

#### 3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	-0.3	4.0	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VBL+-VBL-	-0.3	18	V	

NOTE ( 1 ) : LCM SHOULD BE GROUNDED DURING LCM HANDLING.

NOTE ( 2 ) : THE ABSOLUTE MAXIMUM RATING VALUES OF THIS PRODUCT ARE NOT ALLOWED TO BE EXCEEDED AT ANY TIMES. SHOULD A MODULE BE USED WITH ANY OF THE ABSOLUTE MAXIMUM RATINGS EXCEEDED, THE CHARACTERISTICS OF THE MODULE MAY NOT BE RECOVERED, OR IN AN EXTREME CASE, THE MODULE MAY BE PERMANENTLY DESTROYED.

#### 3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20°C	70°C	-30°C	80°C	NOTE ( 1 ), ( 2 ), ( 3 ), ( 4 )
HUMIDITY	NOTE ( 3 )		NOTE ( 3 )		WITHOUT CONDENSATION
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE ( 1 ) : THE ABSOLUTE MAXIMUM RATINGS OF THIS PRODUCT SHOULD NOT BE EXCEEDED AT ANY TIME. IF THESE RATINGS ARE EXCEEDED, THE PRODUCT'S PERFORMANCE IS NOT GUARANTEED AND THE PRODUCT MAY EXPERIENCE PERMANENT DAMAGE.

NOTE ( 2 ) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE.

NOTE ( 3 ) :  $T_a \leq 60^\circ\text{C}$  : 90%RH MAX.

$T_a > 60^\circ\text{C}$  : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 60°C.

NOTE ( 4 ) : WHEN THE LCD MODULE IS OPERATED AT A HIGHER AMBIENT TEMPERATURE THAN 60°C, THE PWM DUTY CYCLE OF THE LED BACKLIGHT SHOULD BE ADJUSTED TO BE LESS THAN TBD%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN TBD%, THEN THERE IS A POSSIBILITY OF DISTORTION AND IRREGULARITY OF THE PICTURE DUE TO LIQUID CRYSTAL BEHAVIOR.

4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3.15	3.30	3.45	V	
LOGIC HIGH INPUT VOLTAGE	VIH	—	0.7VDD	—	VDD	V	NOTE (1)
LOGIC LOW INPUT VOLTAGE	VIL	—	VSS	—	0.3VDD	V	NOTE (1)
LOGIC HIGH OUTPUT VOLTAGE	VOH	—	VDD-0.4	—	VDD	V	NOTE (1)
LOGIC LOW OUTPUT VOLTAGE	VOL	—	VSS	—	VSS+0.4	V	NOTE (1)
POWER SUPPLY CURRENT	IDD	VDD-VSS =3.3V	—	60	85	mA	NOTE (2)
POWER SUPPLY VOLTAGE FOR LED DRIVER	VBL+-VBL-	—	11.5	12.0	12.5	V	
BL ENABLE INPUT HIGH LEVEL	BL_EN	—	1.8	—	—	V	
BL ENABLE INPUT LOW LEVEL		—	—	—	0.6	V	
BL_PWM LOGIC INPUT HIGH LEVEL	BL_PWM	—	1.8	—	—	V	
BL_PWM LOGIC INPUT LOW LEVEL		—	—	—	0.6	V	
PWM INPUT FREQUENCY	FPWM	—	1	—	20	KHz	
PWM DUTY RATIO	Duty	—	1.0	—	100	%	
POWER SUPPLY CURRENT FOR LED DRIVER	IBL	VBL+-VBL- =12.0V LED B/L=ON	—	110	130	mA	
LED LIFE TIME	—	IF = 20mA (PER LED)	30K	—	—	HRS	NOTE (3) NOTE (4)

NOTE (1) : APPLIED TO TERMINALS, DR0~DR7, DG0~DG7, DB0~DB7, DCLK, STBYB, HSYNC, VSYNC, DE.

NOTE (2) : THE DISPLAY PATTERN IS ALL "WHITE".

NOTE (3) : CONDITIONS; Ta=25 °C, CONTINUOUS LIGHTING.

NOTE (4) : DEFINITIONS OF LIFE TIME :

LCM LUMINANCE BECOMES HALF OF THE INITIAL VALUE.

## 5. TIMING CHARACTERISTICS

### 5.1 LCD MODULE PARALLEL RGB INTERFACE

#### 5.1.1 PARALLEL RGB TIMING TABLE

##### PARALLEL 24-BIT RGB INPUT TIMING

PARALLEL 24-BIT RGB INTERFACE TIMING TABLE						
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
DCLK FREQUENCY	Fclk	23	25	27	MHz	
HSYNC	PERIOD TIME	Th	808	816	848	DCLK
	DISPLAY PERIOD	Thdisp	800			DCLK
	BACK PORTH	Thbp	4	8	24	DCLK
	FRONT PORTH	Thfp	4	8	24	DCLK
	PULSE WIDTH	Thw	2	4	8	DCLK
VSYNC	PERIOD TIME	Tv	496	512	528	HSYNC
	DISPLAY PERIOD	Tvdisp	480			HSYNC
	BACK PORTH	Tvbp	8	16	24	HSYNC
	FRONT PORTH	Tvfp	8	16	24	HSYNC
	PULSE WIDTH	Tvw	2	4	8	HSYNC

NOTE(1) : THE MINIMUM BLANKING TIME DEPENDS ON THE GIP TIMING OF THE PANEL SPECIFICATION.

NOTE(2) : TO ENSURE THE COMPATIBILITY OF DIFFERENT PANELS, IT IS RECOMMENDED TO USE THE TYPICAL SETTING.

NOTE(3) : IT IS NECESSARY TO KEEP Tvbp=16 AND Thbp=8 IN SYNC MODE. DE MODE IS UNNECESSARY TO KEEP IT.

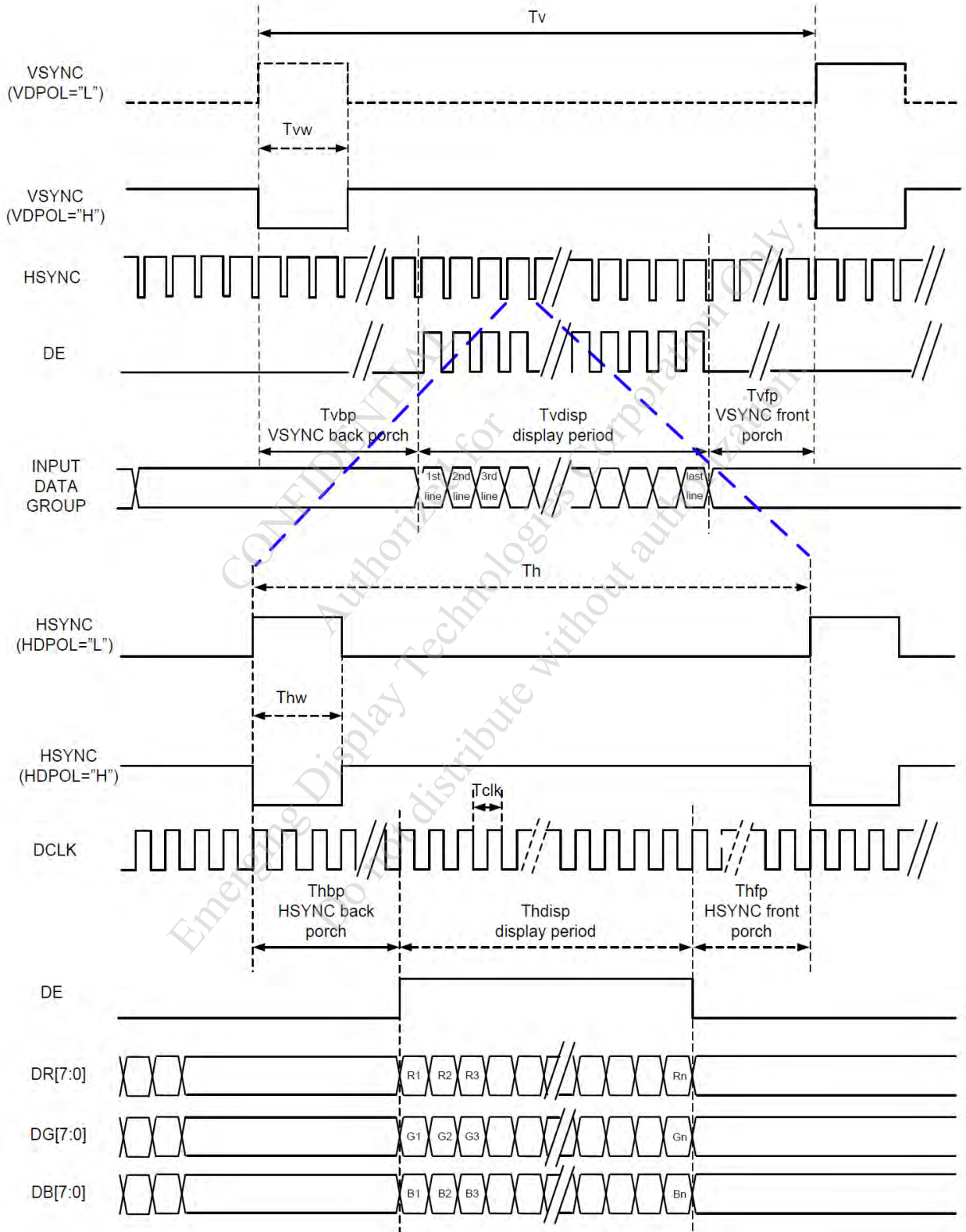
NOTE(4) : THE MAXIMUM DCLK FREQUENCY IS 27MHz. IF THE CASE NEEDS FASTER DCLK, PLEASE CONTACT SITRONIX.

#### 5.1.2 RGB INTERFACE

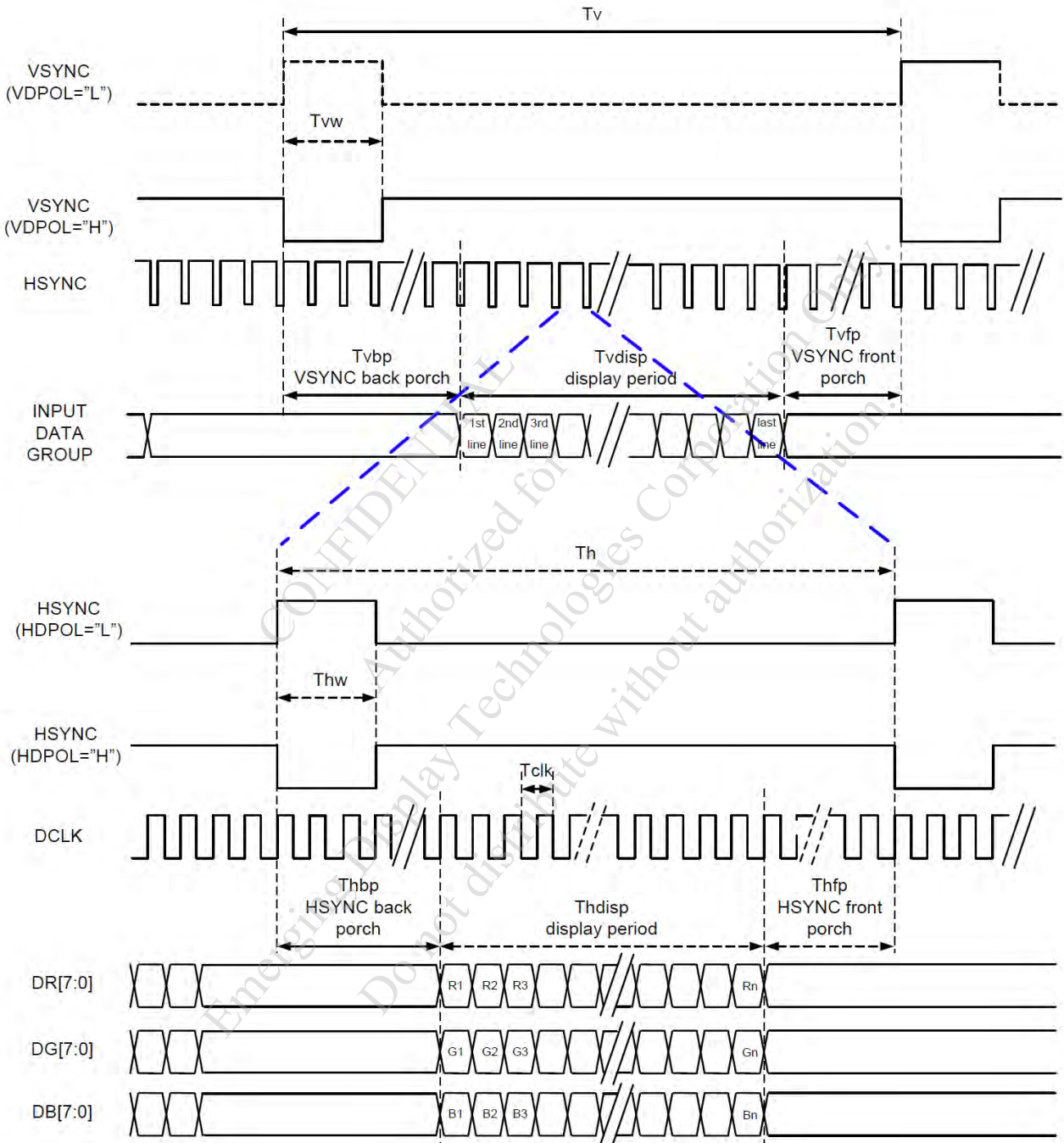
RGB MODE SELECTION TABLE	DCLK	HSYNC	VSYNC	DE
SYNC-DE MODE	INPUT	INPUT	INPUT	INPUT
SYNC MODE	INPUT	INPUT	INPUT	GND
DE MODE	INPUT	GND	GND	INPUT

NOTE : "INPUT" MEANS THESE SIGNALS ARE DRIVEN BY HOST SIDE.

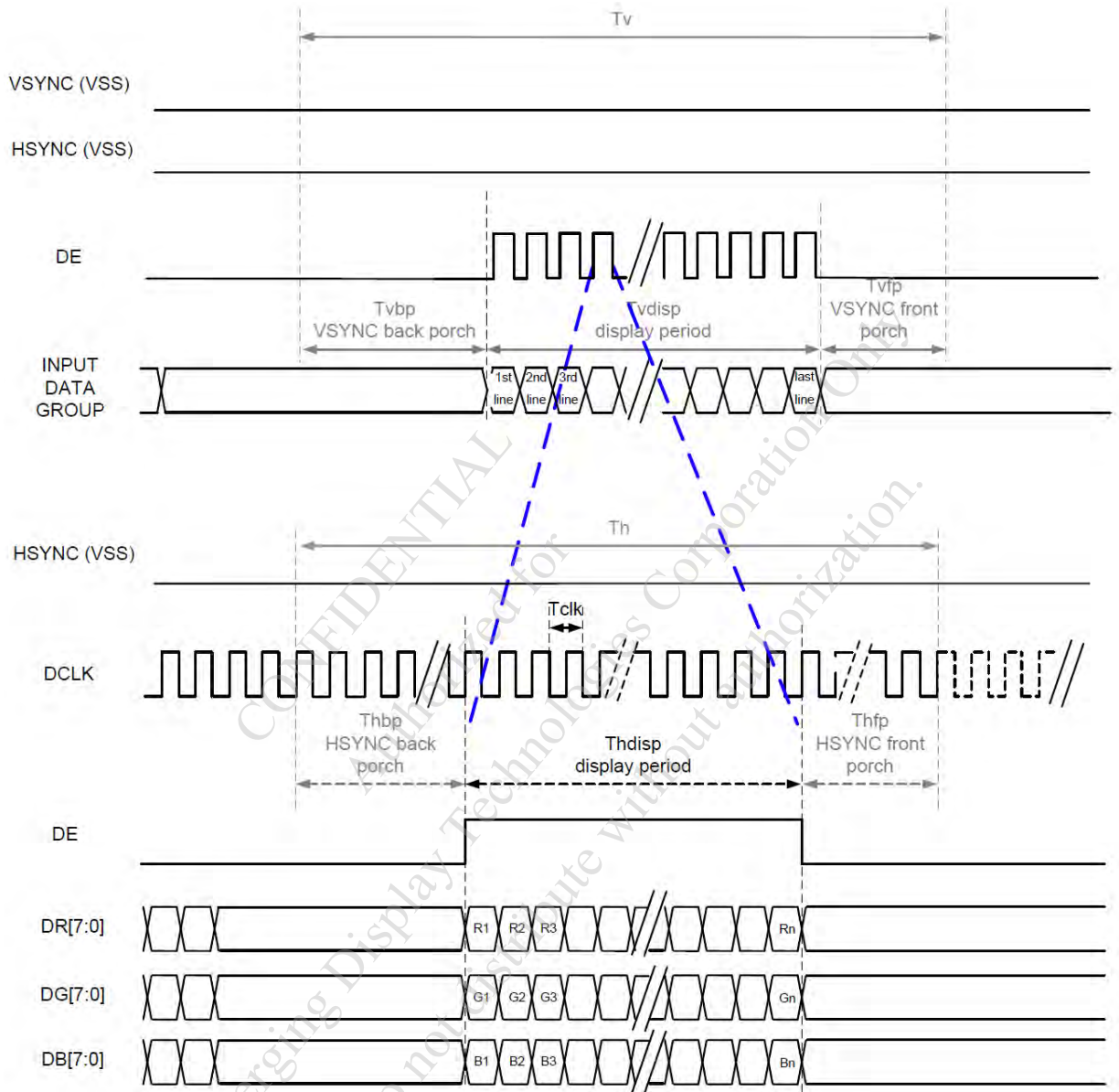
5.1.2.1 SYNC-DE MODE TIMING DIAGRAM  
(DCLKPOL=H, VDPOL=H, HDPOL=H)



5.1.2.2 SYNC MODE TIMING DIAGRAM  
(DCLKPOL=H, VDPOL=H, HDPOL=H)



5.1.2.3 DE MODE TIMING DIAGRAM (DCLKPOL=H)



5.2 AC CHARACTERISTICS

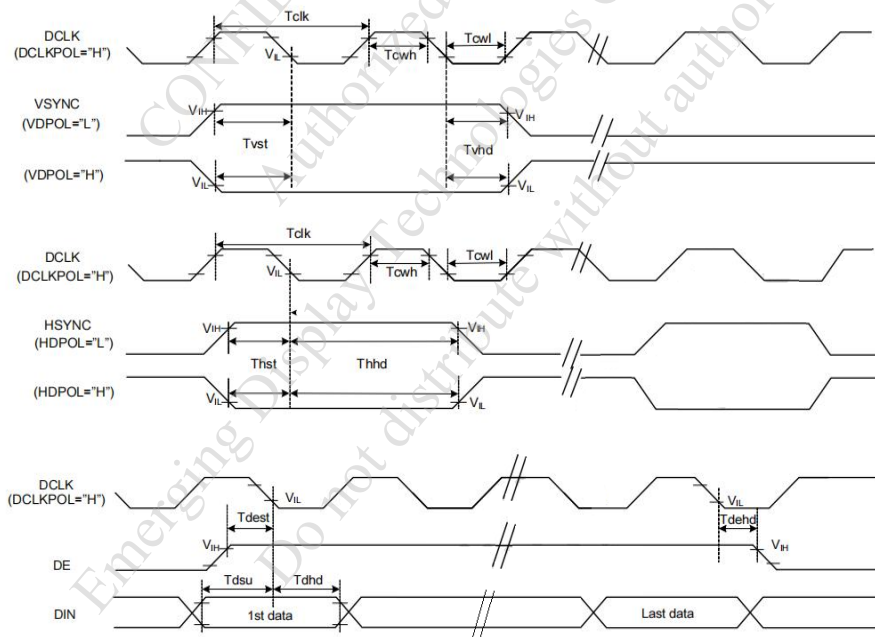
5.2.1 SYSTEM OPERATION AC CHARACTERISTICS

DC ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
VDD POWER SOURCE SLEW TIME	TOPR	—	—	20	ms	FROM 0V TO 99% VDD
GRB PULSE WIDTH	tRSTW	10	50	—	us	R=10Kohm, C=1uF
SD OUTPUT STABLE TIME	Tst	—	—	12	us	OUTPUT SETTLED WITHIN +20mV LOADING=6.8K+28.2pF
GD OUTOUT RISE AND FALL TIME	Tgst	—	—	6	us	OUTPUT SETTLED (5%~95%) LOADING=4.7K+29.8pF

5.2.2 SYSTEM BUS TIMING FOR RGB INTERFACE(DCLKPOL=H, VDPOL=H, HDPOL=H)

DCLK Neagtive Polarity (DCLKPOL="H")

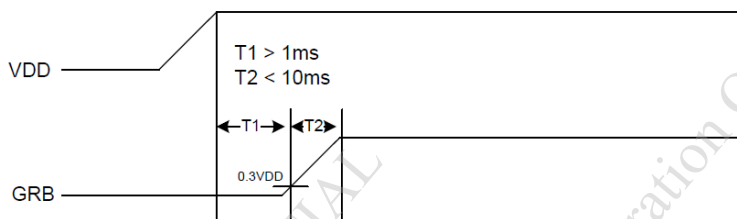
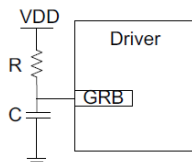


ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
CLK PULSE DUTY	Tcw	40	50	60	%	
VSYNC SETUP TIME	Tvst	10	—	—	ns	
VSYNC HOLD TIME	Tvhd	10	—	—	ns	
HSYNC SETUP TIME	That	10	—	—	ns	
HSYNC HOLD TIME	Thhd	10	—	—	ns	
DATA SETUP TIME	Tdsu	10	—	—	ns	
DATA HOLD TIME	Tdhd	10	—	—	ns	
DE SETUP TIME	Tdest	10	—	—	ns	
DE HOLD TIME	tsehd	10	—	—	ns	

### 5.2.3 RESET TIMING

SETTING GRB PIN TO “L” (HARDWARE RESET) CAN INITIALIZE INTERNAL FUNCTION. INITIALIZED BY GRB PIN IS ESSENTIAL BEFORE OPERATING.

THE GRB PIN WITH EXTERNAL RC CIRCUIT.(R=10K AND C=1μF)

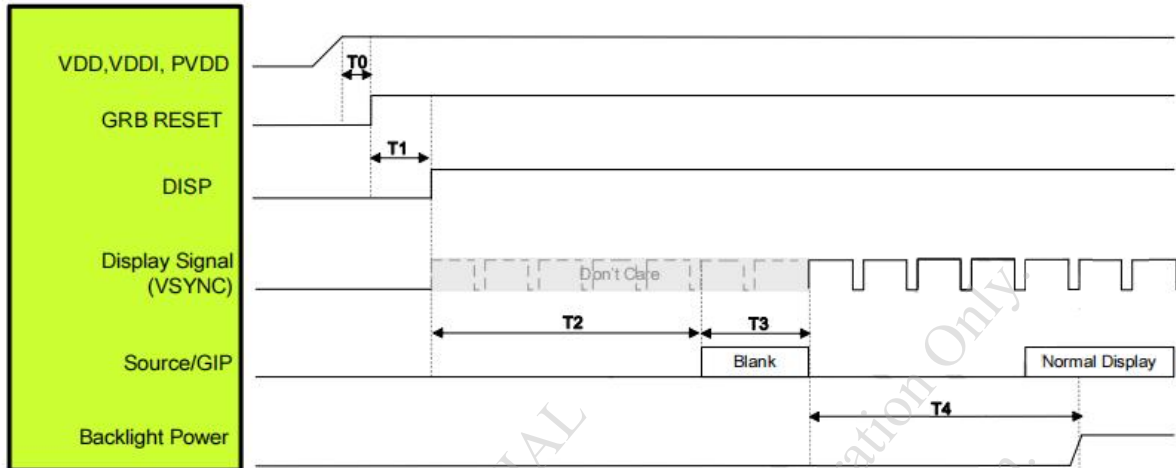


### 5.3 DATA FORMAT

PARALLEL RGB888					
PIN	1 <sup>st</sup> DATA	2 <sup>nd</sup> DATA	3 <sup>rd</sup> DATA	...	N <sup>th</sup> DATA
DR0	1'R0	2'R0	3'R0	...	N'R0
DR1	1'R1	2'R1	3'R1	...	N'R1
DR2	1'R2	2'R2	3'R2	...	N'R2
DR3	1'R3	2'R3	3'R3	...	N'R3
DR4	1'R4	2'R4	3'R4	...	N'R4
DR5	1'R5	2'R5	3'R5	...	N'R5
DR6	1'R6	2'R6	3'R6	...	N'R6
DR7	1'R7	2'R7	3'R7	...	N'R7
DG0	1'G0	2'G0	3'G0	...	N'G0
DG1	1'G1	2'G1	3'G1	...	N'G1
DG2	1'G2	2'G2	3'G2	...	N'G2
DG3	1'G3	2'G3	3'G3	...	N'G3
DG4	1'G4	2'G4	3'G4	...	N'G4
DG5	1'G5	2'G5	3'G5	...	N'G5
DG6	1'G6	2'G6	3'G6	...	N'G6
DG7	1'G7	2'G7	3'G7	...	N'G7
DB0	1'B0	2'B0	3'B0	...	N'B0
DB1	1'B1	2'B1	3'B1	...	N'B1
DB2	1'B2	2'B2	3'B2	...	N'B2
DB3	1'B3	2'B3	3'B3	...	N'B3
DB4	1'B4	2'B4	3'B4	...	N'B4
DB5	1'B5	2'B5	3'B5	...	N'B5
DB6	1'B6	2'B6	3'B6	...	N'B6
DB7	1'B7	2'B7	3'B7	...	N'B7

## 5.4 POWER ON/OFF SEQUENCE

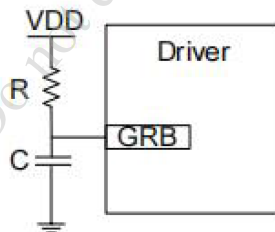
### 5.4.1 POWER ON SEQUENCE



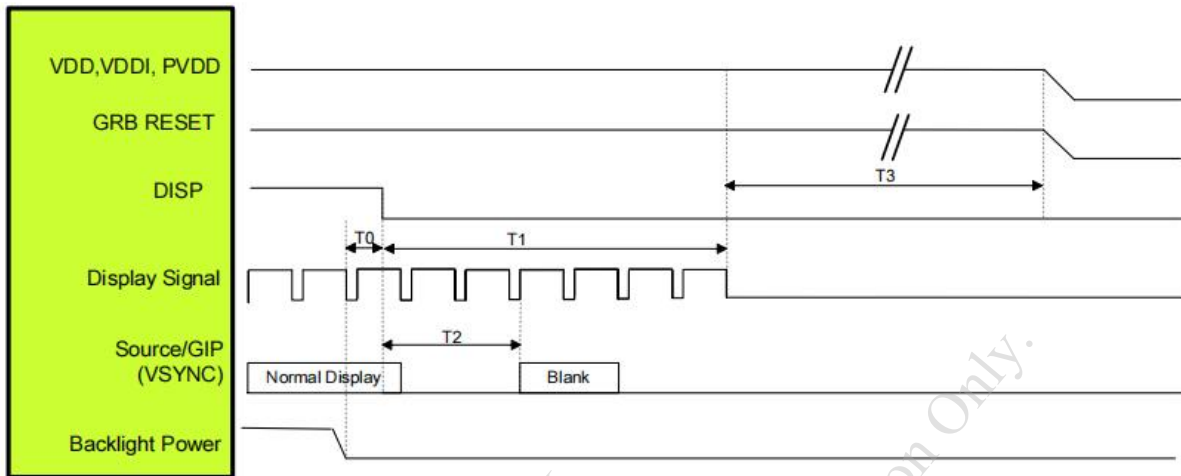
SYMBOL	DESCRIPTION	TIME	UNIT
T0	SYSTEM POWER STABILITY TO RGB RESET SIGNAL	≥1	ms
T1	RGB RESET="HIGH" TO DISP ="HIGH"	≥10	ms
T2	DISP ="HIGH" TO SOURCE/GIP SCAN BLANK	85	ms
T3	IC SCAN BLANKING SIGNAL	≥33	ms
T4	DISPLAY SIGNAL INPUT TO BACKLIGHT POWER ON (BASE ON DISPLAY SIGNAL FRAME RATE 60Hz)	≥100	ms

**NOTE:**

- (1) WHEN DISP PULL "H" OR "L", IC WILL EXECUTE THE INTERNAL POWER ON OR POWER OFF PROCEDURES. PLEASE BE CAREFUL ABOUT THE TIMING OF DISP AND DO NOT INTERRUPT IT DURING POWER ON OR POWER OFF PROCEDURE, OTHERWISE UNEXPECTED ERRORS WILL OCCUR.
- (2) RGB INTERFACE DISPLAY SIGNAL : DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0].
- (3) SETTING GRB PIN TO "L" (HARDWARE RESET) CAN INITIALIZE INTERNAL FUNCTION. INITIALIZED BY GRB PIN IS ESSENTIAL BEFORE OPERATING. NOW RC CIRCUIT IS BUILT IN FPC, T0=10ms.



### 5.4.2 POWER OFF SEQUENCE



SYMBOL	DESCRIPTION	TIME	UNIT
T0	BACKLIGHT POWER OFF TO DISP="LOW"	$\geq 1$	ms
T1	DISP="LOW" TO IC INTERNAL VOLTAGE DISCHARGE COMPLETE	$\geq 100$	ms
T2	DISP="LOW" TO SOURCE/GIP SCAN BLANK (BASE ON DISPLAY SIGNAL FRAME RATE 60Hz)	$\geq 50$	ms
T3	IC INTERNAL VOLTAGE DISCHARGE IS COMPLETED TO VDD/VDDI/PVDD OFF	$\geq 0$	ms

NOTE:

- (1) WHEN DISP PULL "H" OR "L", IC WILL EXECUTE THE INTERNAL POWER ON OR POWER OFF PROCEDURES. PLEASE BE CAREFUL ABOUT THE TIMING OF DISP AND DO NOT INTERRUPT IT DURING POWER ON OR POWER OFF PROCEDURE, OTHERWISE UNEXPECTED ERRORS WILL OCCUR.
- (2) RGB INTERFACE DISPLAY SIGNAL: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0].

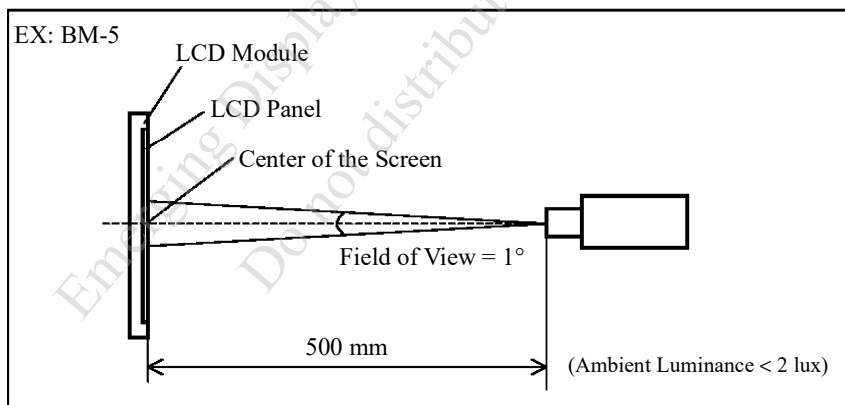
6. OPTICAL CHARACTERISTICS

Ta=25±2°C

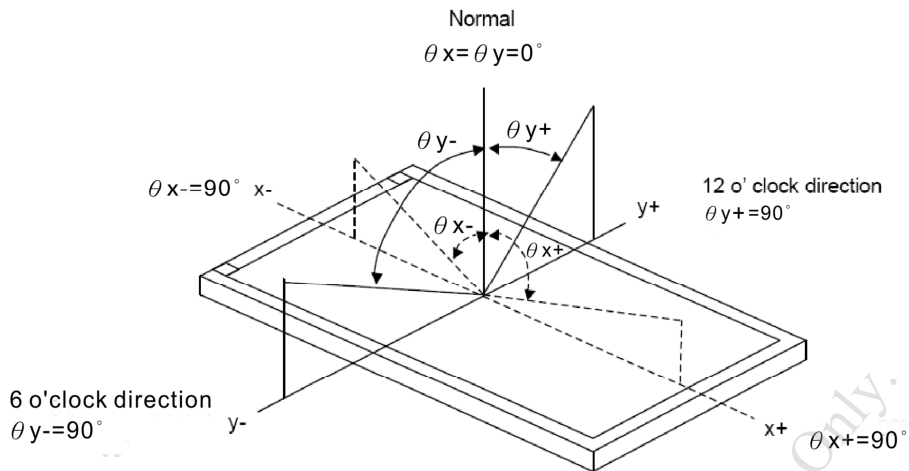
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK	
VIEWING ANGLE	$\theta_{y+}$	CR ≥ 10	70	80	—	deg.	NOTE (2) NOTE (3)	
	$\theta_{y-}$							$\theta_x=0^\circ$
	$\theta_{x+}$		$\theta_y=0^\circ$	70	80			—
	$\theta_{x-}$			70	80			—
CONTRAST RATIO (CENTER)	CR	$\theta_x=0^\circ, \theta_y=0^\circ$	1000	1200	—	—	NOTE (3)	
RESPONSE TIME	TR(rise)+TF(fall)		—	30	40	msec	NOTE (4)	
COLOR CHROMATICITY (CENTER)	WHITE	$\theta_x=0^\circ, \theta_y=0^\circ$ VDD-VSS=3.30V VBL+-VBL- =12.0V PWM=100%	0.26	0.31	0.36	—	NOTE (5)	
			0.29	0.34	0.39			
	RED		0.56	0.61	0.66	—		
			0.29	0.34	0.39			
	GREEN		0.30	0.35	0.40	—		
			0.54	0.59	0.64			
	BLUE		0.10	0.15	0.20	—		
			0.06	0.11	0.16			
THE BRIGHTNESS OF MODULE (CENTER)	B		800	1000	—	cd/m <sup>2</sup>	NOTE (6)	
THE UNIFORMITY OF MODULE(9 POINTS)	—		70	—	—	%	NOTE (7)	

NOTE (1) : TEST CONDITION :

AFTER STABILIZING AND LEAVING THE PANEL ALONE AT A GIVEN TEMPERATURE FOR 30 MINUTES. MEASUREMENT SHOULD BE EXECUTED IN A STABLE, WINDLESS, AND DARK ROOM. THE MEASUREMENT CRITERIA AND CONDITION FOR EITHER BM-5 OR CA-210 OR EQUIVALENT LUMINANCE METER IS BASED ON THE EQUIPMENT'S MANUAL.



NOTE (2) : DEFINITION OF VIEWING ANGLE :



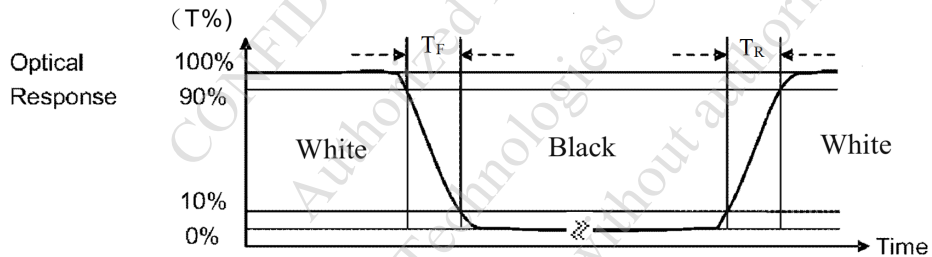
NOTE (3) : DEFINITION OF CONTRAST RATIO (CR) :

MEASURED AT THE CENTER POINT OF MODULE

$$\text{CONTRAST RATIO (CR)} = \frac{\text{BRIGHTNESS MEASURED WHEN LCD IS AT "WHITE STATE"}}{\text{BRIGHTNESS MEASURED WHEN LCD IS AT "BLACK STATE"}}$$

NOTE (4) : DEFINITION OF RESPONSE TIME :  $T_R$  AND  $T_F$

THE FIGURE BELOW IS THE OUTPUT SIGNAL OF THE PHOTO DETECTOR.



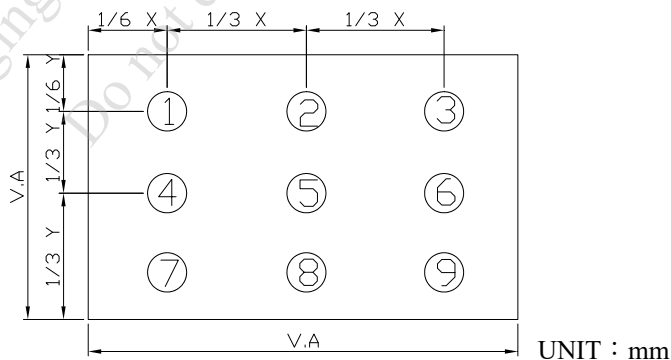
NOTE (5) : DEFINITION OF COLOR CHROMATICITY

(a) 100% RGB PIXEL DATA TRANSMISSION WHEN ALL THE INPUT TERMINALS OF MODULE ARE ELECTRICALLY POWERED ON.

(b) MEASURED AT THE CENTER POINT OF MODULE

NOTE (6) : MEASURED THE BRIGHTNESS OF WHITE STATE AT CENTER POINT.

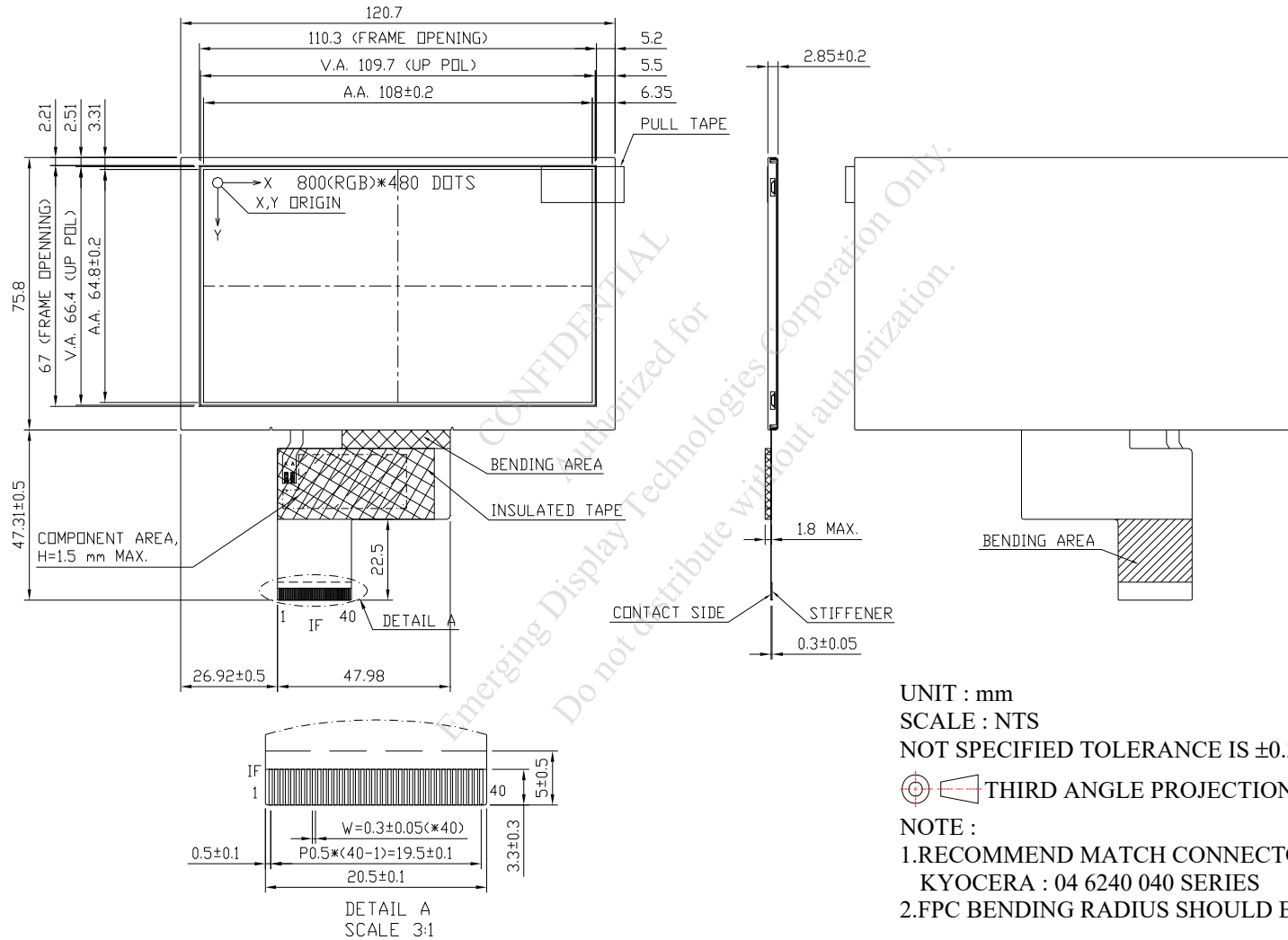
NOTE (7) : (a) DEFINITION OF BRIGHTNESS UNIFORMITY



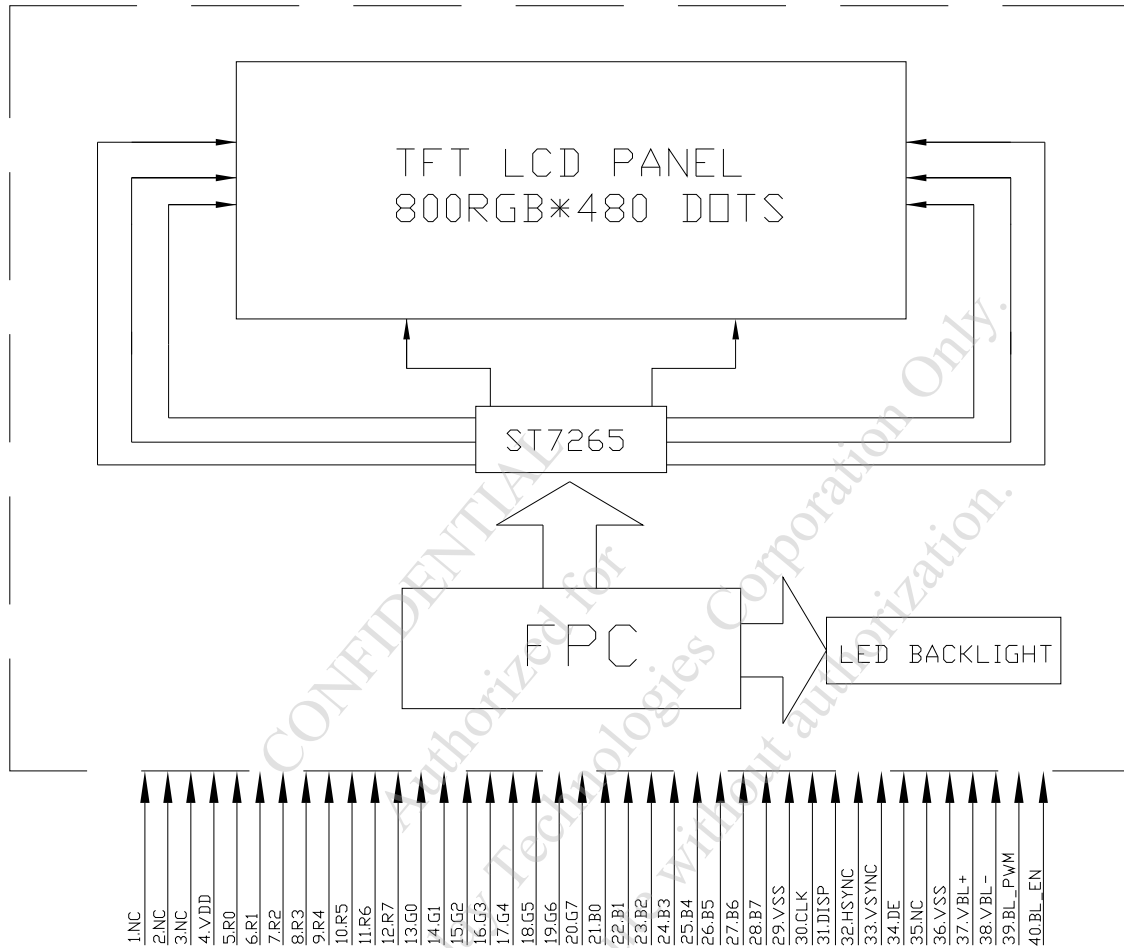
(b) THE BRIGHTNESS UNIFORMITY CALCULATING METHOD

$$\text{UNIFORMITY} : \frac{\text{MINIMUM BRIGHTNESS}}{\text{MAXIMUM BRIGHTNESS}} * 100\%$$

7. OUTLINE DIMENSIONS

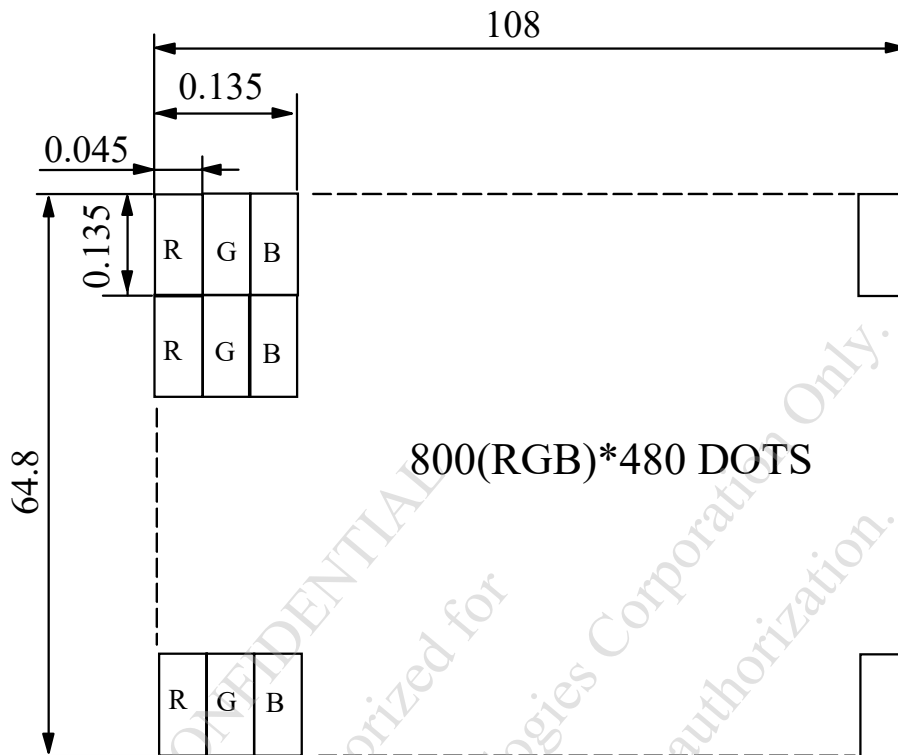


8. BLOCK DIAGRAM



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9. DETAIL DRAWING OF DOT MATRIX



UNIT : mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS  $\pm 0.1$   
DOTS MATRIX TOLERANCE IS  $\pm 0.01$

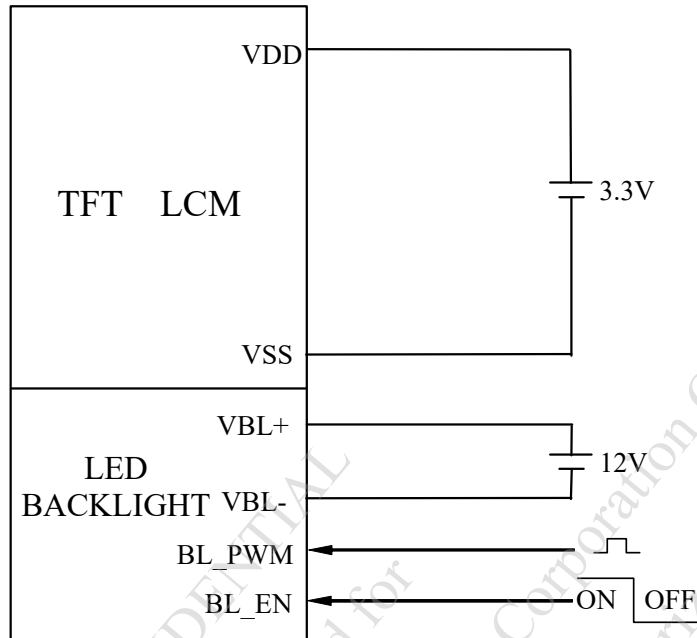
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10. INTERFACE SIGNALS

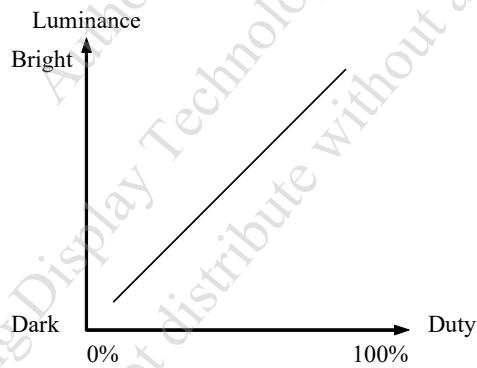
PIN NO.	SYMBOL	FUNCTION
1	NC	NON CONNECTION(REERVED FOR EDT USED)
2	NC	NON CONNECTION(REERVED FOR EDT USED)
3	NC	NON CONNECTION(REERVED FOR EDT USED)
4	VDD	POWER SUPPLY (+3.3V)
5~12	R0~R7	RED DATA BUS
13~20	G0~G7	GREEN DATA BUS
21~28	B0~B7	BLUE DATA BUS
29	VSS	GROUND
30	CLK	DATA CLOCK
31	DISP	STANDBY MODE SELECT PIN
32	HSYNC	LINE SYNC SIGNAL
33	VSYNC	FRAME SYNC SIGNAL
34	DE	DATA ENABLE PIN
35	NC	NON CONNECTION(REERVED FOR EDT USED)
36	VSS	GROUND
37	VBL+	POWER SUPPLY VOLTAGE FOR LED DRIVER (+12.0V)
38	VBL-	GROUND
39	BL_PWM	PWM INPUT SIGNAL FOR LED DRIVER
40	BL_EN	ENABLE PIN FOR LED DRIVER

11. POWER SUPPLY

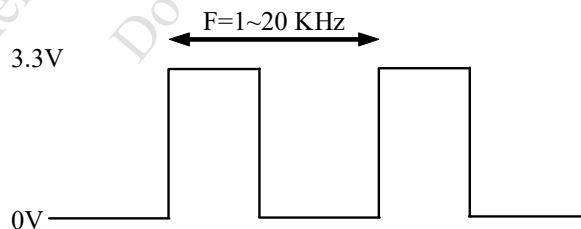
11.1 POWER SUPPLY FOR LCM



NOTE ( 1 ) : ADJUST THE PWM SIGNAL IN ORDER TO CONTROL LED BACKLIGHT'S BRIGHTNESS. THE HIGHER THE DUTY CYCLE, THE HIGHER THE BRIGHTNESS



NOTE ( 2 ) : PWM SIGNAL OPERATION FREQUENCY IS 1~20 KHz AND DIMMING DUTY.



F <sub>PWM</sub> (Hz)	D <sub>MIN</sub>	D <sub>MAX</sub>
1.0K < F ≤ 5.0K	1.0%	100%
5.0K < F ≤ 10.0K	2.0%	100%
10.0K < F ≤ 15.0K	3.0%	100%
15.0K < F ≤ 20.0K	4.0%	100%

## 12. INSPECTION CRITERIA

### 12.1 APPLICATION

THIS INSPECTION STANDARD IS TO BE APPLIED TO THE LCD MODULE DELIVERED FROM EMERGING DISPLAY TECHNOLOGIES CORP.( E.D.T ) TO CUSTOMERS

### 12.2 INSPECTION CONDITIONS

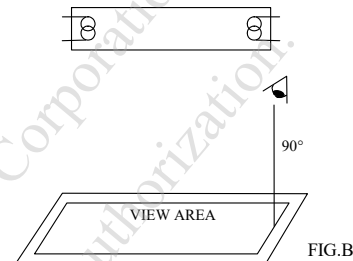
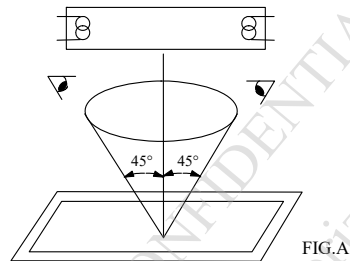
12.2.1 (1)OBSERVATION DISTANCE :  $45 \pm 5$ cm

(2)VIEWING ANGLE :  $\pm 45^\circ$

$\pm 45^\circ$  (FOR SECTION WITHIN VIEWING AREA), REFER TO FIG.A

$90^\circ$  (FOR SECTION OUTSIDE OF VIEWING AREA), REF TO FIG.B  
PERPENDICULAR TO MODULE SURFACE

VIEWING ANGLE SHOULD BE SMALLER THAN  $45^\circ$



THE INSPECTION CRITERIA IS ACCORDING TO LINE OF SIGHT. INSPECTION SHALL BE MADE WITHIN THE HALF SECTION OF THE VIEWING CONE GENERATED BY LINE SEGMENT OF  $45^\circ$  WITH RESPECTS TO THE VERTICAL AXIS FROM CENTER VERTEX OF LCD, THE FLUORESCENT LAMP AND THE CONE AXIS MUST BE PERPENDICULAR TO THE LCD SURFACE.

IF THE DEFECTS ARE OUTSIDE OF VIEWING AREA, IT SHALL BE INSPECTED BY  $90^\circ$  WITH RESPECTS TO THE VERTICAL AXIS FROM EDGE OF VIEWING AREA.

### 12.2.2 ENVIRONMENT CONDITIONS :

AMBIENT TEMPERATURE		$25 \pm 5^\circ\text{C}$
AMBIENT HUMIDITY		$65 \pm 20\% \text{RH}$
AMBIENT ILLUMINATION	COSMETIC INSPECTION	600~800 lux
	FUNCTIONAL INSPECTION	300~500 lux
INSPECTION TIME		10 secs

### 12.2.3 INSPECTION LOT

QUANTITY PER DELIVERY LOT FOR EACH MODEL

### 12.2.4 INSPECTION METHOD

A SAMPLING INSPECTION SHALL BE MADE ACCORDING TO THE FOLLOWING PROVISIONS TO JUDGE THE ACCEPTABILITY

(a)APPLICABLE STANDARD :

ANSI/ ASQ Z1.4 NORMAL INSPECTION LEVEL II

(b)AQL : MAJOR DEFECT : AQL 0.65

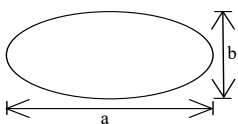
MINOR DEFECT : AQL 1.0

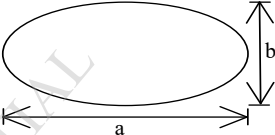
12.3 INSPECTION STANDARDS

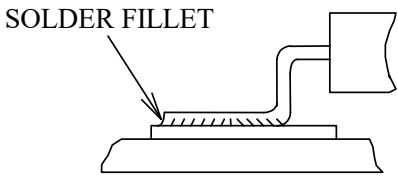
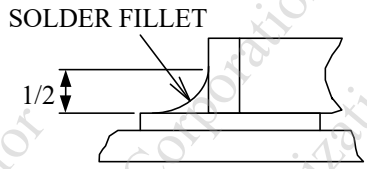
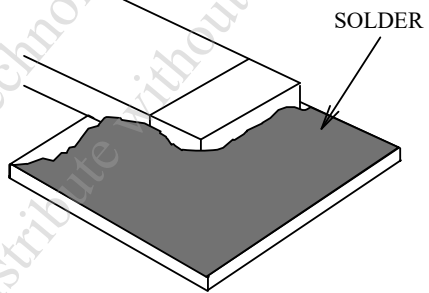
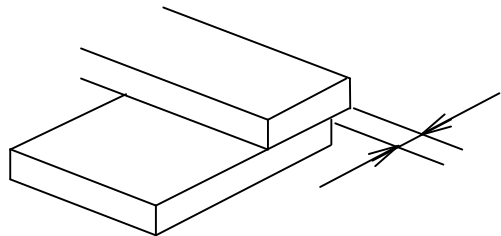
12.3.1 VISUAL DEFECTS CLASSIFICATION

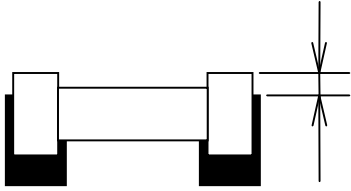
TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	<ul style="list-style-type: none"> <li>• DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS</li> <li>EX: DISCONNECTION, SHORT CIRCUIT ETC</li> </ul>	0.65
	2.BACKLIGHT	<ul style="list-style-type: none"> <li>• NO LIGHT</li> <li>• FLICKERING AND OTHER ABNORMAL ILLUMINATION</li> </ul>	
	3.DIMENSIONS	<ul style="list-style-type: none"> <li>• SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS</li> </ul>	
MINOR DEFECT	1.DISPLAY ZONE	<ul style="list-style-type: none"> <li>• BLACK/WHITE SPOT</li> <li>• BUBBLES ON POLARIZER</li> <li>• NEWTON RING</li> <li>• BLACK/WHITE LINE</li> <li>• SCRATCH</li> <li>• CONTAMINATION</li> <li>• UNEVEN COLOR SPREAD</li> </ul>	1.0
	2.BEZEL ZONE	<ul style="list-style-type: none"> <li>• STAINS</li> <li>• SCRATCHES</li> <li>• FOREIGN MATTER</li> </ul>	
	3.SOLDERING	<ul style="list-style-type: none"> <li>• INSUFFICIENT SOLDER</li> <li>• SOLDERED IN INCORRECT POSITION</li> <li>• CONVEX SOLDERING SPOT</li> <li>• SOLDER BALLS</li> <li>• SOLDER SCRAPS</li> </ul>	
	4.DISPLAY ON (ALL ON)	<ul style="list-style-type: none"> <li>• LIGHT LINE</li> </ul>	

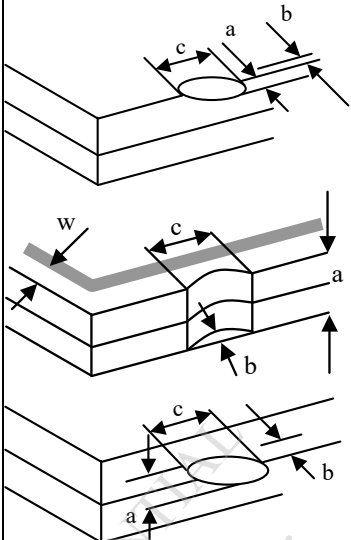
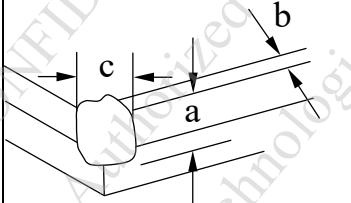

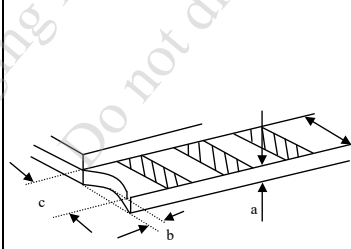
12.3.2 MODULE DEFECTS CLASSIFICATION

NO.	ITEM	CRITERIA																				
1.	DISPLAY ON INSPECTION	1.INCORRECT PATTERN 2.MISSING SEGMENT 3.DIM SEGMENT 4.OPERATING VOLTAGE BEYOND SPEC																				
2.	OVERALL DIMENSIONS	1.OVERALL DIMENSION BEYOND SPEC																				
3.	DOT DEFECT	<p>1.INSPECTION PATTERN: FULL WHITE, FULL BLACK, RED, GREEN AND BLUE SCREENS.</p> <p>2.</p> <table border="1"> <thead> <tr> <th>ITEM</th> <th>INSPECTION CRITERION</th> </tr> </thead> <tbody> <tr> <td>BRIGHT PIXEL DOT QUANTITY</td> <td>1</td> </tr> <tr> <td>2 CONNECTED BRIGHT PIXEL DOT</td> <td>0</td> </tr> <tr> <td>3 CONNECTED BRIGHT PIXEL DOT OR MORE</td> <td>0</td> </tr> <tr> <td>DARK PIXEL DOT QUANTITY</td> <td>3</td> </tr> <tr> <td>2 CONNECTED DARK PIXEL DOT</td> <td>1</td> </tr> <tr> <td>3 CONNECTED DARK PIXEL DOT OR MORE</td> <td>0</td> </tr> <tr> <td>TOTAL DOT DEFECT</td> <td>4</td> </tr> <tr> <td>2 BRIGHT PIXEL DOTS DISTANCE <math>DS \geq 5mm</math></td> <td></td> </tr> <tr> <td>2 DARK PIXEL DOTS DISTANCE <math>DS \geq 5mm</math></td> <td></td> </tr> </tbody> </table> <p>NOTE :</p> <p>1. THE DEFINITION OF DOT : THE SIZE OF A DEFECTIVE DOT OVER 1/2 OF WHOLE DOT IS REGARDED AS ONE DEFECTIVE DOT.</p> <p>2. BRIGHT DOT : DOTS APPEAR BRIGHT AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER BLACK PATTERN. THE BRIGHT DOT DEFECT MUST BE VISIBLE THROUGH 5% ND FILTER.</p> <p>3. DARK DOT : DOTS APPEAR DARK AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER PURE RED, GREEN, BLUE PICTURE.</p> <p>4. BRIGHT PIXEL DOT :POWER ON TFT AND RGB DOT IN BLACK DISPLAY.</p> <p>5. DARK PIXEL DOT : POWER ON TFT AND GRAY OR BLACK DOT IN RGB DISPLAY.</p> <p>6. MULTI-BRIGHT PIXEL DOT, POWER ON TFT AND FLUORESCENT TINY DOT IN BLACK DISPLAY (ONLY VISIBLE IN DISPLAY)</p>	ITEM	INSPECTION CRITERION	BRIGHT PIXEL DOT QUANTITY	1	2 CONNECTED BRIGHT PIXEL DOT	0	3 CONNECTED BRIGHT PIXEL DOT OR MORE	0	DARK PIXEL DOT QUANTITY	3	2 CONNECTED DARK PIXEL DOT	1	3 CONNECTED DARK PIXEL DOT OR MORE	0	TOTAL DOT DEFECT	4	2 BRIGHT PIXEL DOTS DISTANCE $DS \geq 5mm$		2 DARK PIXEL DOTS DISTANCE $DS \geq 5mm$	
ITEM	INSPECTION CRITERION																					
BRIGHT PIXEL DOT QUANTITY	1																					
2 CONNECTED BRIGHT PIXEL DOT	0																					
3 CONNECTED BRIGHT PIXEL DOT OR MORE	0																					
DARK PIXEL DOT QUANTITY	3																					
2 CONNECTED DARK PIXEL DOT	1																					
3 CONNECTED DARK PIXEL DOT OR MORE	0																					
TOTAL DOT DEFECT	4																					
2 BRIGHT PIXEL DOTS DISTANCE $DS \geq 5mm$																						
2 DARK PIXEL DOTS DISTANCE $DS \geq 5mm$																						
4.	FOREIGN BLACK/WHITE/ BRIGHT LINE/ SCRATCH OF VIEWING AREA	<table border="1"> <thead> <tr> <th>LENGTH : L</th> <th>WIDTH : W</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>—</td> <td><math>W \leq 0.03</math></td> <td>IGNORE</td> </tr> <tr> <td><math>L \leq 5.0</math></td> <td><math>0.03 &lt; W \leq 0.05</math></td> <td>3</td> </tr> <tr> <td><math>L \leq 3.0</math></td> <td><math>0.05 &lt; W \leq 0.08</math></td> <td>2</td> </tr> <tr> <td>—</td> <td><math>0.08 &lt; W</math></td> <td>NONE</td> </tr> </tbody> </table> <p>WIDTH : W mm, LENGTH : L mm</p>	LENGTH : L	WIDTH : W	PERMISSIBLE NO.	—	$W \leq 0.03$	IGNORE	$L \leq 5.0$	$0.03 < W \leq 0.05$	3	$L \leq 3.0$	$0.05 < W \leq 0.08$	2	—	$0.08 < W$	NONE					
LENGTH : L	WIDTH : W	PERMISSIBLE NO.																				
—	$W \leq 0.03$	IGNORE																				
$L \leq 5.0$	$0.03 < W \leq 0.05$	3																				
$L \leq 3.0$	$0.05 < W \leq 0.08$	2																				
—	$0.08 < W$	NONE																				
5.	FOREIGN MATTER \ BLACK SPOTS \ WHITE SPOTS \ DENT (INCLUDING LIGHT LEAKAGE DUE TO POLARIZING PLATES PINHOLES, ETC.)	<table border="1"> <thead> <tr> <th>AVERAGE DIAMETER (mm): D</th> <th>NUMBER OF PIECES PERMITTED</th> </tr> </thead> <tbody> <tr> <td><math>D \leq 0.15</math></td> <td>IGNORE</td> </tr> <tr> <td><math>0.15 &lt; D \leq 0.3</math></td> <td>2</td> </tr> <tr> <td><math>0.3 &lt; D</math></td> <td>NONE</td> </tr> </tbody> </table> <p>NOTE : DIAMETER <math>D=(a+b)/2</math></p> 	AVERAGE DIAMETER (mm): D	NUMBER OF PIECES PERMITTED	$D \leq 0.15$	IGNORE	$0.15 < D \leq 0.3$	2	$0.3 < D$	NONE												
AVERAGE DIAMETER (mm): D	NUMBER OF PIECES PERMITTED																					
$D \leq 0.15$	IGNORE																					
$0.15 < D \leq 0.3$	2																					
$0.3 < D$	NONE																					

NO.	ITEM	CRITERIA	
		AVERAGE DIAMETER (mm) : D	NUMBER OF PIECES PERMITTED
6.	BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS	BUBBLE ON THE POLARIZER	IGNORE
			N ≤ 2
			NONE
<p>NOTE : (1)POLARIZER BUBBLE IS DEFINED AS THE BUBBLE APPEARS ON ACTIVE DISPLAY AREA. THE DEFECT OF POLARIZER BUBBLE SHALL BE IGNORED IF THE POLARIZER BUBBLE APPEARS ON THE OUTSIDE OF ACTIVE DISPLAY AREA.</p> <p>(2)THE EXTRANEIOUS SUBSTANCE IS DEFINED AS IT CAN BE OBSERVED WHEN THE MODULE IS POWER ON.</p> <p>(3)THE DEFINITION OF AVERAGE DIAMETER, D IS DEFINED AS FOLLOWING.</p> <p>AVERAGE DIAMETER (D)=(a+b)/2</p> 			
7.	LINE DEFECT ON DISPLAY	OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOWED	
8.	MURA ON DISPLAY	IT'S OK IF MURA IS SLIGHT VISIBLE THROUGH 5% ND FILTER	
9.	UNEVEN COLOR SPREAD, COLORATION	1.TO BE DETERMINED BASED UPON THE STANDARD SAMPLE.	
10.	BEZEL APPEARANCE	<p>1.BEZEL MAY NOT HAVE RUST, BE DEFORMED OR HAVE FINGER PRINTS STAINS OF OTHER CONTAMINATION.</p> <p>2.BEZEL MUST COMPLY WITH JOB SPECIFICATIONS.</p>	
11	PCB	<p>1.THERE MAY NOT BE MORE THAN 2mm OF SEALANT OUTSIDE THE SEAL AREA ON THE PCB, AND THERE SHOULD BE NO MORE THAN THREE PLACES.</p> <p>2.NO OXIDATION OR CONTAMINATION PCB TERMINALS.</p> <p>3.PARTS ON PCB MUST BE THE SAME AS ON THE PRODUCTION CHARACTERISTIC CHART. THERE SHOULD BE NO WRONG PARTS, MISSING PARTS OR EXCESS PARTS.</p> <p>4.THE JUMPER ON THE PCB SHOULD CONFORM TO THE PRODUCT CHARACTERISTIC CHART.</p> <p>5.IF SOLDER GETS ON BEZEL TAB PADS, LED PAD, ZEBRA PAD OR SCREW HOLD PAD; MAKE SURE IT IS SMOOTHED DOWN.</p>	

NO.	ITEM	CRITERIA
12.	SOLDERING	<p>1.NO SOLDERING FOUND ON THE SPECIFIED PLACE 2.INSUFFICIENT SOLDER</p> <p>(a)LSI, IC A POOR WETTING OF SOLDER IS BETWEEN LOWER BEND OR "HEEL" OF LEAD AND PAD</p>  <p>(b)CHIP COMPONENT · SOLDER IS LESS THAN 50% OF SIDES AND FRONT FACE WETTING</p>  <p>· SOLDER WETS 3 SIDES OF TERMINAL, BUT LESS THAN 25% OF SIDES AND FRONT SURFACE AREA ARE COVERED</p>  <p>3.PARTS ALIGNMENT (a)LSI, IC LEAD WIDTH IS MORE THAN 50% BEYOND PAD OUTLINE</p> 

NO.	ITEM	CRITERIA
12.	SOLDERING	<p>(b)CHIP COMPONENT COMPONENT IS OFF CENTER, AND MORE THAN 50% OF THE LEADS IS OFF THE PAD OUTLINE</p>  <p>4.NO UNMELTED SOLDER PASTE MAY BE PRESENT ON THE PCB. 2.NO COLD SOLDER JOINTS, MISSING SOLDER CONNECTIONS, OXIDATION OR ICICLE. 6.NO RESIDUE OR SOLDER BALLS ON PCB. 7.NO SHORT CIRCUITS IN COMPONENTS ON PCB.</p>
13.	BACKLIGHT	<p>1.NO LIGHT 2.FLICKERING AND OTHER ABNORMAL ILLUMINATION 3.SPOTS OR SCRATCHES THAT APPEAR WHEN LIT MUST BE JUDGED USING LCD SPOT, LINES AND CONTAMINATION STANDARDS. 4.BACKLIGHT DOESN'T LIGHT OR COLOR IS WRONG.</p>
14.	GENERAL APPEARANCE	<p>1.NO OXIDATION, CONTAMINATION, CURVES OR, BENDS ON INTERFACE PIN (OLB) OF TCP. 2.NO CRACKS ON INTERFACE PIN (OLB) OF TCP. 3.NO CONTAMINATION, SOLDER RESIDUE OR SOLDER BALLS ON PRODUCT. 4.THE IC ON THE TCP MAY NOT BE DAMAGED, CIRCUITS. 5.THE UPPERMOST EDGE OF THE PROTECTIVE STRIP ON THE INTERFACE PIN MUST BE PRESENT OR LOOK AS IF IT CAUSE THE INTERFACE PIN TO SEVER. 6.THE RESIDUAL ROSIN OR TIN OIL OF SOLDERING (COMPONENT OR CHIP COMPONENT) IS NOT BURNED INTO BROWN OR BLACK COLOR. 7.SEALANT ON TOP OF THE ITO CIRCUIT HAS NOT HARDENED. 8.PIN TYPE MUST MATCH TYPE IN SPECIFICATION SHEET. 9.LCD PIN LOOSE OR MISSING PINS. 10.PRODUCT PACKAGING MUST THE SAME AS SPECIFIED ON PACKAGING SPECIFICATION SHEET. 11.PRODUCT DIMENSION AND STRUCTURE MUST CONFORM TO PRODUCT SPECIFICATION SHEET. 12.THE APPEARANCE OF HEAT SEAL SHOULD NOT ADMIT ANY DIRT AND BREAK.</p>

NO.	ITEM	CRITERIA									
15.	CRACKED GLASS	<p>THE LCD WITH EXTENSIVE CRACK IS NOT ACCEPTABLE</p> <p>GENERAL GLASS CHIP :</p>  <table border="1"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td><math>\leq t/2</math></td> <td>&lt; VIEWING AREA</td> <td><math>\leq 1/8X</math></td> </tr> <tr> <td><math>t/2 &gt; , \leq 2t</math></td> <td><math>\leq W/2</math></td> <td><math>\leq 1/8X</math></td> </tr> </tbody> </table> <p>*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE X = LCD SIDE LENGTH t = GLASS THICKNESS</p>	a	b	c	$\leq t/2$	< VIEWING AREA	$\leq 1/8X$	$t/2 > , \leq 2t$	$\leq W/2$	$\leq 1/8X$
		a	b	c							
		$\leq t/2$	< VIEWING AREA	$\leq 1/8X$							
		$t/2 > , \leq 2t$	$\leq W/2$	$\leq 1/8X$							
		<p>CORNER PART :</p>  <table border="1"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td><math>\leq t/2</math></td> <td>&lt; VIEWING AREA</td> <td><math>\leq 1/8X</math></td> </tr> <tr> <td><math>&gt; t/2 , \leq 2t</math></td> <td><math>\leq W/2</math></td> <td><math>\leq 1/8X</math></td> </tr> </tbody> </table> <p>*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE X = LCD SIDE LENGTH t = GLASS THICKNESS</p>	a	b	c	$\leq t/2$	< VIEWING AREA	$\leq 1/8X$	$> t/2 , \leq 2t$	$\leq W/2$	$\leq 1/8X$
a	b	c									
$\leq t/2$	< VIEWING AREA	$\leq 1/8X$									
$> t/2 , \leq 2t$	$\leq W/2$	$\leq 1/8X$									
<p>CHIP ON ELECTRODE PAD</p>  <table border="1"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td><math>\leq t</math></td> <td><math>\leq 0.5\text{mm}</math></td> <td><math>\leq 1/8X</math></td> </tr> </tbody> </table> <p>* X=LCD SIDE WIDTH t =GLASS THICKNESS</p>	a	b	c	$\leq t$	$\leq 0.5\text{mm}$	$\leq 1/8X$					
a	b	c									
$\leq t$	$\leq 0.5\text{mm}$	$\leq 1/8X$									
 <table border="1"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td><math>\leq t</math></td> <td><math>\leq 1/8X</math></td> <td><math>\leq L</math></td> </tr> </tbody> </table> <p>*X=LCD SIDE WIDTH t = GLASS THICKNESS L=ELECTRODE PAD LENGTH</p> <p>①IF GLASS CHIPPING THE ITO TERMINAL, OVER 2/3 OF THE ITO MUST REMAIN AND BE, INSPECTED ACCORDING TO ELECTRODE TERMINAL SPECIFICATIONS</p> <p>②IF THE PRODUCT WILL BE HEAT SEALED BY THE CUSTOMER, THE ALIGNMENT MARK MUST NOT BE DAMAGED</p>	a	b	c	$\leq t$	$\leq 1/8X$	$\leq L$					
a	b	c									
$\leq t$	$\leq 1/8X$	$\leq L$									

### 13. RELIABILITY TEST

#### 13.1 STANDARD SPECIFICATIONS FOR RELIABILITY OF LCD MODULE

NO.	ITEM	DESCRIPTION
1	HIGH TEMPERATURE TEST (OPERATION)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +70°C FOR 240 HRS
2	LOW TEMPERATURE TEST (OPERATION)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -20°C FOR 240 HRS
3	HIGH TEMPERATURE TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +80°C FOR 240 HRS
4	LOW TEMPERATURE TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -30°C FOR 240 HRS
5	HIGH TEMPERATURE / HUMIDITY TEST (OPERATION)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 60°C, 90% RH 240 HRS
6	THERMAL SHOCK TEST (NOT OPERATED)	<p>THE SAMPLE SHOULD BE ALLOWED TO STAND THE FOLLOWING 10 CYCLES OF OPERATION:</p>
7	VIBRATION (NOT OPERATED)	11.76 m/s <sup>2</sup> (1.2G), 10~100 Hz XYZ DIRECTIONS, 1 HR EACH
8	SHOCK (NOT OPERATED)	490.0 m/s <sup>2</sup> (50G), 10 ms XYZ DIRECTIONS, 1 TIME EACH
9	ESD (ELECTROSTATIC DISCHARGE) (NOT OPERATED)	AIR DISCHARGE ±12KV CONTACT DISCHARGE ±8KV ACCORDING IEC-61000-4-2

NOTE ( 1 ) : THE TEST SAMPLES HAVE RECOVERY TIME FOR 2 HOURS AT ROOM TEMPERATURE BEFORE THE FUNCTION CHECK. IN THE STANDARD CONDITIONS, THERE IS NO DISPLAY FUNCTION NG ISSUE OCCURRED.

NOTE ( 2 ) : THERE IS NO DISPLAY FUNCTION NG ISSUE OCCURRED, ALL THE COSMETIC SPECIFICATION IS JUDGED BEFORE THE RELIABILITY STRESS.

NOTE ( 3 ) : THE MODULE SHOULDN'T BE TESTED MORE THAN ONE CONDITION, AND ALL THE TEST CONDITIONS ARE INDEPENDENT.

NOTE ( 4 ) : WHEN THE LCD MODULE IS OPERATED AT A HIGHER AMBIENT TEMPERATURE THAN 60°C, THE PWM DUTY CYCLE OF THE LED BACKLIGHT SHOULD BE ADJUSTED TO BE LESS THAN (TBD)%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN (TBD)%, THEN THERE IS A POSSIBILITY OF DISTORTION AND IRREGULARITY OF THE PICTURE DUE TO LIQUID CRYSTAL BEHAVIOR.

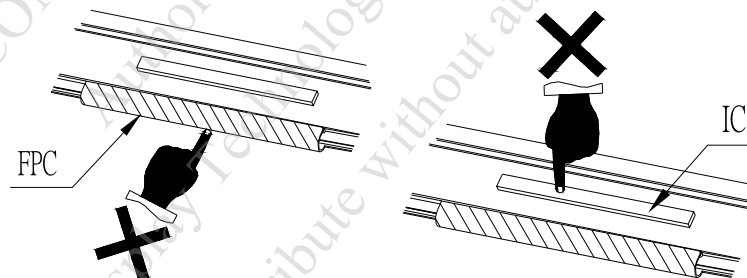
NOTE ( 5 ) : TESTING CONDITIONS AND INSPECTION CRITERIA

NO.	ITEM	TEST MODEL	INSPECTION CRITERIA
1	CURRENT CONSUMPTION	REFER TO SPECIFICATION	THE CURRENT CONSUMPTION SHOULD CONFORM TO THE PRODUCT SPECIFICATION.
2	CONTRAST	REFER TO SPECIFICATION	AFTER THE TESTS HAVE BEEN EXECUTED, THE CONTRAST MUST BE LARGER THAN HALF OF ITS INITIAL VALUE PRIOR TO THE TESTS.
3	APPEARANCE	VISUAL INSPECTION	DEFECT FREE

## 14. CAUTION

### 14.1 OPERATION

- 14.1.1 DO NOT CONNECT OR DISCONNECT MODULES TO OR FROM THE MAIN SYSTEM WHILE POWER IS BEING SUPPLIED.
- 14.1.2 USE THE MODULE WITHIN SPECIFIED TEMPERATURE; LOWER TEMPERATURE CAUSES THE RETARDATION OF BLINKING SPEED OF THE DISPLAY; HIGHER TEMPERATURE MAKES OVERALL DISPLAY DISCOLOR. WHEN THE TEMPERATURE RETURNS TO NORMALITY, THE DISPLAY WILL OPERATE NORMALLY.
- 14.1.3 ADJUST THE LC DRIVING VOLTAGE TO OBTAIN THE OPTIMUM CONTRAST.
- 14.1.4 POWER ON SEQUENCE INPUT SIGNALS SHOULD NOT BE SUPPLIED TO LCD MODULE BEFORE POWER SUPPLY VOLTAGE IS APPLIED AND REACHES THE SPECIFIED VALUE.  
IF ABOVE SEQUENCE IS NOT FOLLOWED, CMOS LSIS OF LCD MODULES MAY BE DAMAGED DUE TO LATCH - UP PROBLEM.
- 14.1.5 NOT ALLOWED TO INFLICT ANY EXTERNAL STRESS AND TO CAUSE ANY MECHANICAL INTERFERENCE ON THE BENDING AREA OF FPC DURING THE TAIL BENDING BACKWARDS!  
DO NOT STRESS FPC AND IC ON THE MODULE!



### 14.2 STORAGE

- 14.2.1 STORE THE MODULE IN A DARK ROOM OR KEEP IN ORIGINAL PACKAGE WHERE MUST KEEP AT  $25\pm 10^{\circ}\text{C}$  AND 65%RH OR LESS.
- 14.2.2 DO NOT STORE THE MODULE IN SURROUNDINGS CONTAINING ORGANIC SOLVENT OR CORROSIVE GAS.
- 14.2.3 STORE THE MODULE IN AN ANTI-ELECTROSTATIC CONTAINER OR BAG.

### 14.3 NOTICE

- 14.3.1 USE A GROUNDED SOLDERING IRON WHEN SOLDERING CONNECTOR I/O TERMINALS. FOR SOLDERING OR REPAIRING, TAKE PRECAUTION AGAINST THE TEMPERATURE OF THE SOLDERING IRON AND THE SOLDERING TIME TO PREVENT PEELING OFF THE THROUGH-HOLE-PAD.
- 14.3.2 DO NOT DISASSEMBLE. EDT SHALL NOT BE HELD RESPONSIBLE IF THE MODULE IS DISASSEMBLED AND UPON THE REASSEMBLY THE MODULE FAILED.
- 14.3.3 DO NOT CHARGE STATIC ELECTRICITY, AS THE CIRCUIT OF THIS MODULE CONTAINS CMOS LSIS. A WORKMAN'S BODY SHOULD ALWAYS BE STATIC-PROTECTED BY USE OF AN ESD STRAP. WORKING CLOTHES FOR SUCH PERSONNEL SHOULD BE OF STATIC-PROTECTED MATERIAL.
- 14.3.4 ALWAYS GROUND THE ELECTRICALLY-POWERED DRIVER BEFORE USING IT TO INSTALL THE LCD MODULE. WHILE CLEANING THE WORK STATION BY VACUUM CLEANER, DO NOT BRING THE SUCKING MOUTH NEAR THE MODULE; STATIC ELECTRICITY OF THE ELECTRICALLY-POWERED DRIVER OR THE VACUUM CLEANER MAY DESTROY THE MODULE.
- 14.3.5 DON'T GIVE EXTERNAL SHOCK.
- 14.3.6 DON'T APPLY EXCESSIVE FORCE ON THE SURFACE.
- 14.3.7 LIQUID IN LCD IS HAZARDOUS SUBSTANCE. MUST NOT LICK AND SWALLOW.  
WHEN THE LIQUID IS ATTACH TO YOUR, SKIN, CLOTH ETC. WASH IT OUT THOROUGHLY AND IMMEDIATELY.
- 14.3.8 DON'T OPERATE IT ABOVE THE ABSOLUTE MAXIMUM RATING.
- 14.3.9 STORAGE IN A CLEAN ENVIRONMENT, FREE FROM DUST, ACTIVE GAS, AND SOLVENT.
- 14.3.10 STORE WITHOUT ANY PHYSICAL LOAD.
- 14.3.11 REWIRING: NO MORE THAN 3 TIMES.