

EXAMINED BY :	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-0009051
Lucica Lu		ISSUE : DEC.06, 2021
APPROVED BY:		TOTAL PAGE : 23
Vincent Uh		VERSION : 5

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
MODEL NO. : <u>ET 0 5 0 0 2 3 U D B A</u> (RoHS) FOR MESSRS : _____		
CUSTOMER'S APPROVAL DATE : _____ BY : _____		

RECORDS OF REVISION

DOC . FIRST ISSUE

AUG.06, 2020

DATE

REVISED
PAGE
NO.

SUMMARY

NOV.06, 2020

2

3.1 TFT MODULE ELECTRICAL ABSOLUTE MAXIMUM RATINGS
POWER DISSIPATION FOR LED BACKLIGHT: MAX.=5712→(6930)
FORWARD CURRENT FOR LED BACKLIGHT: MAX.=240→(300)

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS
NOTE (4) : 50%→TBD%

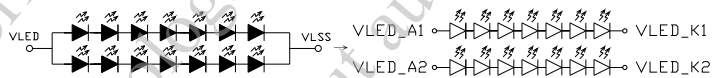
3

4. ELECTRICAL CHARACTERISTICS

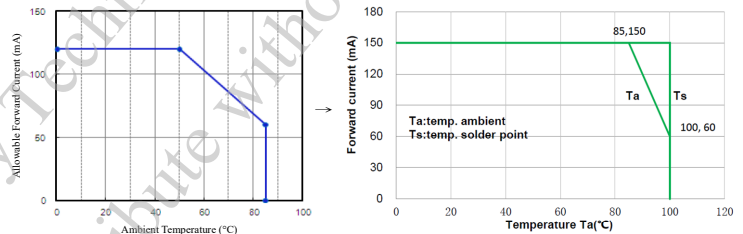
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3.15	3.30	3.45	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VBL+VSS	—	9	12	15	V	
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	120	170	mA	NOTE (2)
LED LIFE TIME	—	IF=120mA (PER LED)	50K	—	—	HRS	NOTE (5) NOTE (6)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3.1	3.3	3.6	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VBL+VSS	—	5	12	15	V	
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	(120)	(170)	mA	NOTE (2)
LED LIFE TIME	—	IF=55mA (PER LED)	50K	—	—	HRS	NOTE (5) NOTE (6)

NOTE (3) :



NOTE (4) :



7,8

6.1 OPTICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
CONTRAST RATIO (CENTER)	CR	$\theta_x=0^\circ, \theta_y=0^\circ$	800	1000	—	—	NOTE (3)
COLOR CHROMATICITY (CENTER)	WHITE	Wx	0.27	0.32	0.37	—	NOTE (5)
		Wy	0.30	0.35	0.40	—	
	RED	Rx	0.54	0.59	0.64	—	
		Ry	0.30	0.35	0.40	—	
	GREEN	Gx	0.32	0.37	0.42	—	
		Gy	0.55	0.60	0.65	—	
	BLUE	Bx	0.10	0.15	0.20	—	
		By	0.04	0.09	0.14	—	

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
CONTRAST RATIO (CENTER)	CR	$\theta_x=0^\circ, \theta_y=0^\circ$	1000	1500	—	—	NOTE (3)
COLOR CHROMATICITY (CENTER)	WHITE	Wx	(0.27)	(0.32)	(0.37)	—	NOTE (5)
		Wy	(0.30)	(0.35)	(0.40)	—	
	RED	Rx	(0.54)	(0.59)	(0.64)	—	
		Ry	(0.30)	(0.35)	(0.40)	—	
	GREEN	Gx	(0.32)	(0.37)	(0.42)	—	
		Gy	(0.55)	(0.60)	(0.65)	—	
	BLUE	Bx	(0.10)	(0.15)	(0.20)	—	
		By	(0.04)	(0.09)	(0.14)	—	

NOTE (7) : (a)DEFINITION OF BRIGHTNESS UNIFORMITY :
ILED=100mA→ILED=110mA

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7. OUTLINE DIMENSIONS

MARK Δ : MODIFY TFT FPC & B/L FPC OUTLINE

RECORDS OF REVISION

DATE	REVISED PAGE NO.	SUMMARY																														
NOV.06, 2020	10	8. BLOCK DIAGRAM MODIFY PIN NO.: 45.NC→45.CS/ID1, 46.NC→46.SDIN/ID2, 47.NC→47.SCK/ID3, 48.STBYB→48.DISPLAY CONTROL(STANDBY)/ID4																														
	13	10. INTERFACE SIGNALS <table><tr><th>PIN NO.</th><th>SYMBOL</th><th>FUNCTION</th></tr><tr><td>45</td><td>NC</td><td>NON CONNECTION (THIS PIN IS RESERVED FOR CSB, AND CLIENT SIDE SHOULD NOT CONNECT TO THIS PIN)</td></tr><tr><td>46</td><td>NC</td><td>NON CONNECTION (THIS PIN IS RESERVED FOR SDA, AND CLIENT SIDE SHOULD NOT CONNECT TO THIS PIN)</td></tr><tr><td>47</td><td>NC</td><td>NON CONNECTION (THIS PIN IS RESERVED FOR SCL, AND CLIENT SIDE SHOULD NOT CONNECT TO THIS PIN)</td></tr><tr><td>48</td><td>STBYB</td><td>STANDBY MODE CONTROL SIGNAL LO: TCON AND SOURCE DRIVER ARE OFF HI : ALL THE FUNCTIONS ARE ON</td></tr></table> <table><tr><th>PIN NO.</th><th>SYMBOL</th><th>FUNCTION</th></tr><tr><td>45</td><td>CS/ID1</td><td>CS FOR LCM-DRIVER SPI-PORT/ID1(SIZE INFO, NOT USED)</td></tr><tr><td>46</td><td>SDIN/ID2</td><td>SDIN FOR LCM-DRIVER SPI-PORT/ID2(SIZE INFO, PULL LOW TO VSS, INTERNAL: 10KΩ)</td></tr><tr><td>47</td><td>SCK/ID3</td><td>SCK FOR LCM-DRIVER SPI-PORT/ID3(SIZE INFO, PULL HIGH TO VDD, INTERNAL: 10KΩ)</td></tr><tr><td>48</td><td>DISPLAY CONTROL (STANDBY)/ID4</td><td>DISPLAY CONTROL (STANDBY)/ID4 (SIZE INFO, NOT USED)</td></tr></table>	PIN NO.	SYMBOL	FUNCTION	45	NC	NON CONNECTION (THIS PIN IS RESERVED FOR CSB, AND CLIENT SIDE SHOULD NOT CONNECT TO THIS PIN)	46	NC	NON CONNECTION (THIS PIN IS RESERVED FOR SDA, AND CLIENT SIDE SHOULD NOT CONNECT TO THIS PIN)	47	NC	NON CONNECTION (THIS PIN IS RESERVED FOR SCL, AND CLIENT SIDE SHOULD NOT CONNECT TO THIS PIN)	48	STBYB	STANDBY MODE CONTROL SIGNAL LO: TCON AND SOURCE DRIVER ARE OFF HI : ALL THE FUNCTIONS ARE ON	PIN NO.	SYMBOL	FUNCTION	45	CS/ID1	CS FOR LCM-DRIVER SPI-PORT/ID1(SIZE INFO, NOT USED)	46	SDIN/ID2	SDIN FOR LCM-DRIVER SPI-PORT/ID2(SIZE INFO, PULL LOW TO VSS, INTERNAL: 10KΩ)	47	SCK/ID3	SCK FOR LCM-DRIVER SPI-PORT/ID3(SIZE INFO, PULL HIGH TO VDD, INTERNAL: 10KΩ)	48	DISPLAY CONTROL (STANDBY)/ID4	DISPLAY CONTROL (STANDBY)/ID4 (SIZE INFO, NOT USED)
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48	DISPLAY CONTROL (STANDBY)/ID4	DISPLAY CONTROL (STANDBY)/ID4 (SIZE INFO, NOT USED)																														
		11.1 POWER SUPPLY FOR LCM NOTE (2) : OPERATION FREQUENCY : 100~10KHz→15±5KHz  <table><tr><th>f_{PMW} (Hz)</th><th>DMIN</th><th>DMAX</th></tr><tr><td>10.0k < f ≤ 15.0k</td><td>1.50%</td><td>100%</td></tr><tr><td>15.0k < f ≤ 20.0k</td><td>2.00%</td><td>100%</td></tr></table>	f _{PMW} (Hz)	DMIN	DMAX	10.0k < f ≤ 15.0k	1.50%	100%	15.0k < f ≤ 20.0k	2.00%	100%																					
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10.0k < f ≤ 15.0k	1.50%	100%																														
15.0k < f ≤ 20.0k	2.00%	100%																														
	16	12.3.2 MODULE DEFECTS CLASSIFICATION NO.4, FOREIGN BLACK/WHITE/BRIGHT LINE/ SCRATCH OF VIEWING AREA: <table><tr><td>LENGTH : L</td><td>LENGTH : L</td></tr><tr><td>0.3 < L ≤ 2.5</td><td>0.3 < L ≤ 3.0</td></tr><tr><td>2.5 < L</td><td>3.0 < L</td></tr></table>	LENGTH : L	LENGTH : L	0.3 < L ≤ 2.5	0.3 < L ≤ 3.0	2.5 < L	3.0 < L																								
LENGTH : L	LENGTH : L																															
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NOV.10, 2020	2	3.1 TFT MODULE ELECTRICAL ABSOLUTE MAXIMUM RATINGS POWER SUPPLY VOLTAGE: MAX.=3.6→4.0																														
MAY.19, 2021	9	7. OUTLINE DIMENSIONS MARK △ : MODIFY FPC OUTLINE DIMENSION & FPC BENDING AREA																														
DEC.06, 2021	9	7. OUTLINE DIMENSIONS MARK △ : ADD FPC BENDING AREA DIMENSION																														

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1. GENERAL SPECIFICATIONS

1.1 DATA SHEET FOR LCD MODULE CONTROLLER/DRIVER

PLEASE REFER TO :

SITRONIX ST7262

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 inch
(2) NUMBER OF DOTS	-----	800W * (RGB) * 480H DOTS
(3) MODULE SIZE	-----	118.5W * 77.55H * 5.03D (MAX.) mm (WITHOUT FPC & PULL TAPE)
(4) VIEWING AREA	-----	110W * 66.8H 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) BACK LIGHT	-----	LED , COLOR : WHITE
(12) INTERFACE MODE	-----	RGB 24 BIT, PARALLEL (DE/SYNC MODE)

3. ABSOLUTE MAXIMUM RATINGS

3.1 TFT MODULE ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	-0.3	4.0	V	
STATIC ELECTRICITY	—	—	—	V	NOTE (1)
POWER DISSIPATION FOR LED BACKLIGHT	PD	—	(6930)	mW	
FORWARD CURRENT FOR LED BACKLIGHT	ILED	—	(300)	mA	

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

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-30°C	80°C	-30°C	80°C	NOTE (1) , (2) , (3) , (4)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	—	2.45 m/s ² (0.25 G)	—	11.76 m/s ² (1.2 G)	10~100 Hz XYZ DIRECTIONS 1 HR EACH
SHOCK	—	29.4 m/s ² (3 G)	—	490 m/s ² (50 G)	10 ms XYZ DIRECTIONS 1 TIME EACH
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) : Ta ≤ 60°C : 90%RH MAX (96HRS MAX).

Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 60°C(96HRS MAX).

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

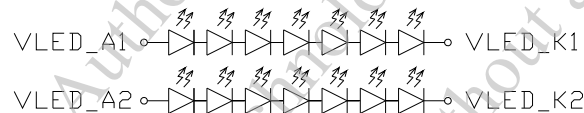
Ta = 25 °C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3.1	3.3	3.6	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VBL+-VSS	—	5	12	15	V	
LOGIC HIGH INPUT VOLTAGE	VIH	—	0.7*VDD	—	VDD	V	NOTE (1)
LOGIC LOW INPUT VOLTAGE	VIL	—	0	—	0.3*VDD	V	NOTE (1)
LOGIC HIGH OUTPUT VOLTAGE	VOH	IOH	0.8*VDD	—	VDD	V	
LOGIC LOW OUTPUT VOLTAGE	VOL	IOL	VSS	—	0.2*VDD	V	NOTE (1)
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	(120)	(170)	mA	NOTE (2)
POWER SUPPLY CURRENT FOR LED DRIVER	IBL	VBL+-VSS=12V LED B/L=ON	—	(250)	(330)	mA	
LED LIFE TIME	—	IF=55mA (PER LED)	50K	—	—	HRS	NOTE (5) NOTE (6)

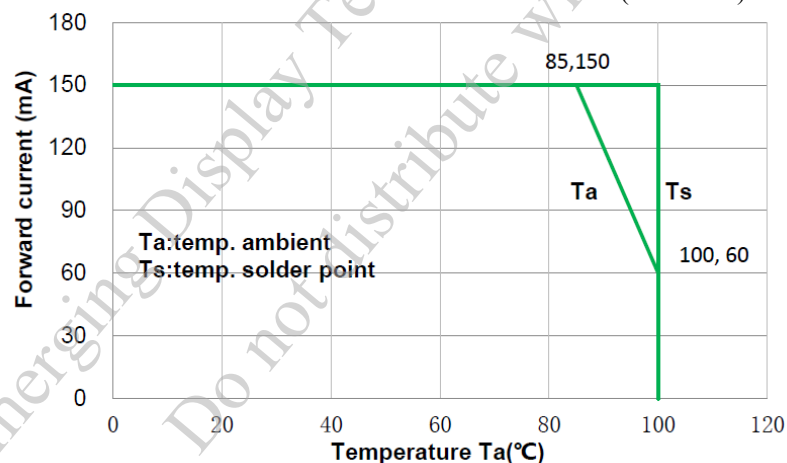
NOTE (1) : APPLIED TO TERMINALS R0~R7, G0~G7, B0~B7, HSYNC, VSYNC, DE, DCLK, STBYB, /RESET.

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

NOTE (3) : INTERNAL CIRCUIT DIAGRAM OF BACKLIGHT



NOTE (4) : AMBIENT TEMP. VS. ALLOWABLE FORWARD CURRENT.(PER LED)



NOTE (5) : CONDITIONS; Ta=25 °C, CONTINUOUS LIGHTING.

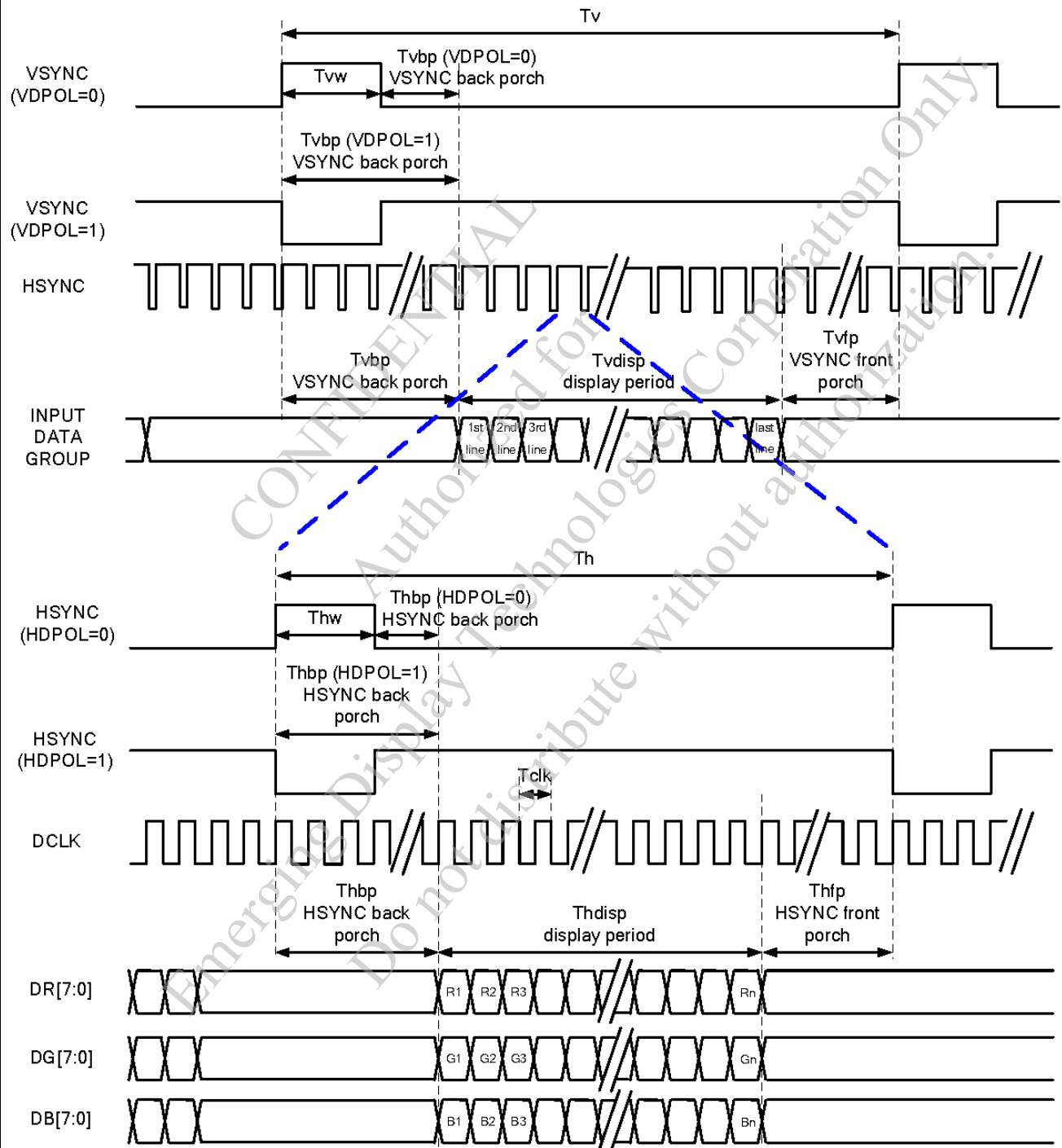
NOTE (6) : DEFINITIONS OF LIFE TIME :

LCM LUMINANCE BECOMES HALF OF THE INITIAL VALUE.

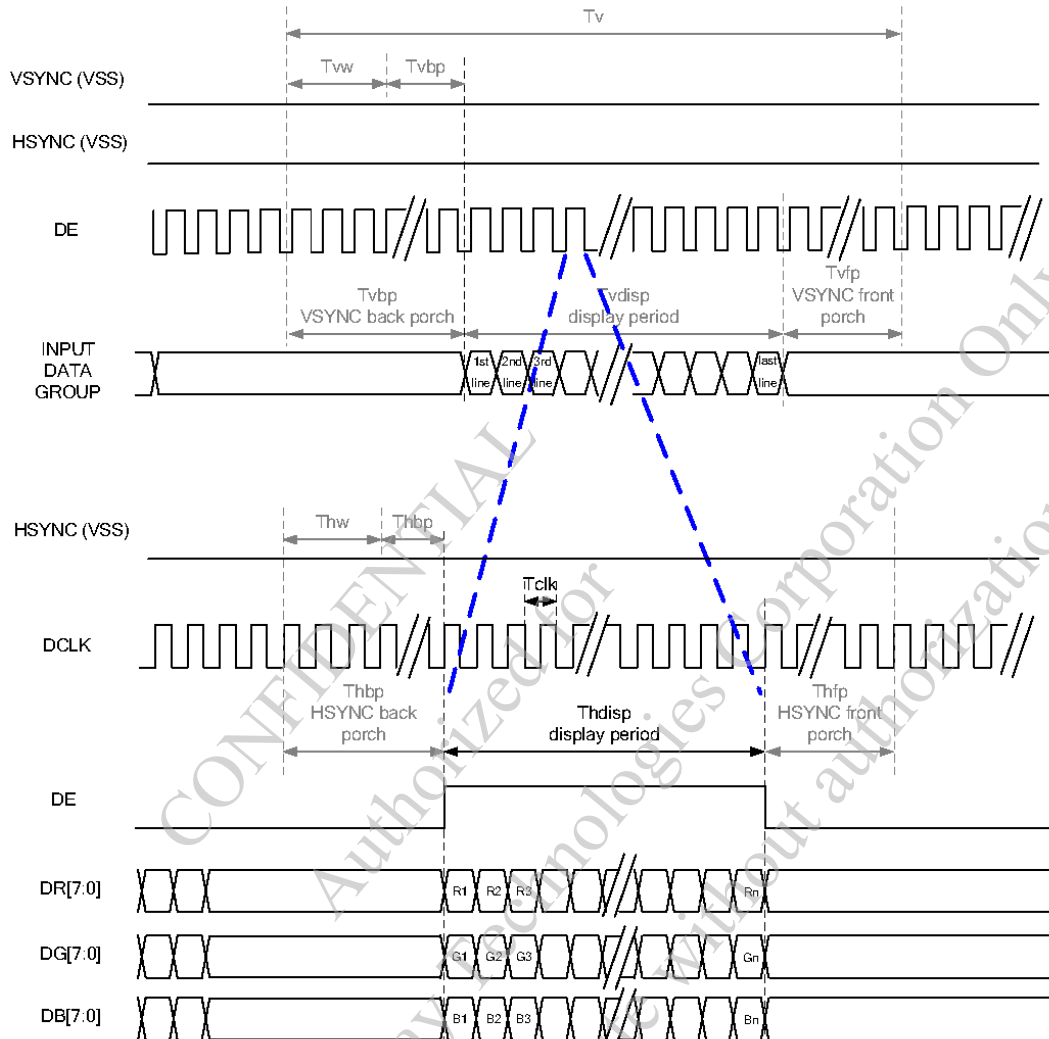
5. TIMING CHARACTERISTICS

5.1 LCD MODULE PARALLEL RGB INTERFACE

5.1.1 SYNC MODE



5.1.2 DE MODE



5.1.3 TIMING TABLE

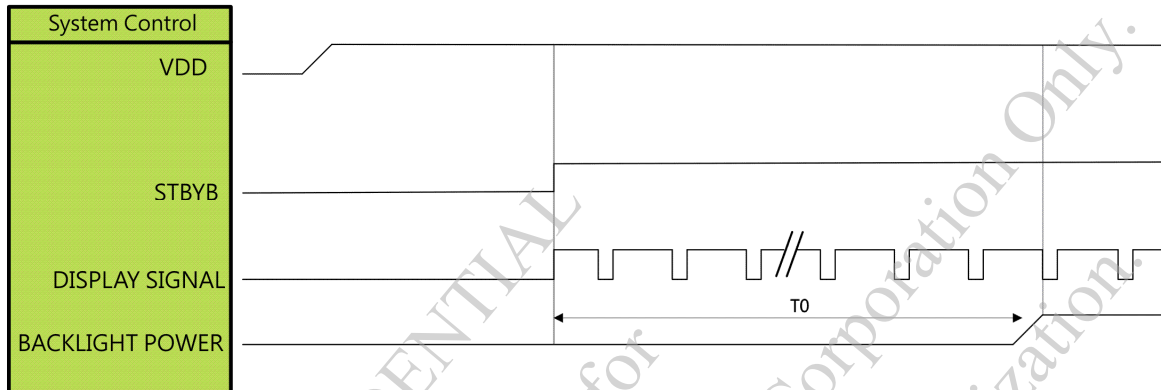
ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT
DCLK FREQUENCY		Fclk	23	25	27	MHz
HSYNC	PERIOD TIME	Th	808	816	896	DCLK
	DISPLAY PERIOD	Thdisp	800	800	800	DCLK
	BACK PORCH	Thbp	4	8	48	DCLK
	FRONT PORCH	Thfp	4	8	48	DCLK
	PULSE WIDTH	Thw	2	4	8	DCLK
VSYNC	PERIOD TIME	Tv	488	496	504	HSYNC
	DISPLAY PERIOD	Tvdisp	480	480	480	HSYNC
	BACK PORCH	Tvbp	4	8	12	HSYNC
	FRONT PORCH	Tvfp	4	8	12	HSYNC
	PULSE WIDTH	Tvw	2	4	8	HSYNC

5.2 POWER ON-OFF TIMING SEQUENCE FOR LCD MODULE

5.2.1 POWER ON SEQUENCE

SYMBOL	DESCRIPTION	MIN. TIME	UNIT
T0	DISPLAY SIGNAL OUTPUT TO BACKLIGHT POWER ON	250	ms

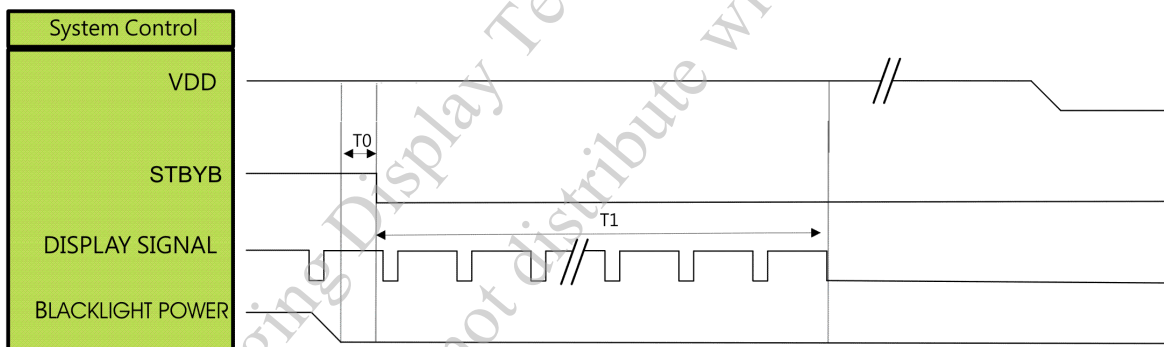
NOTE: RGB INTERFACE DISPLAY SIGNAL: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]



5.2.2 POWER OFF TIMING SEQUENCE

SYMBOL	DESCRIPTION	MIN. TIME	UNIT
T0	BACKLIGHT POWER OFF TO DISP="LOW"	5	ms
T1	DISP="LOW" TO IC INTERNAL VOLTAGE DISCHARGE COMPLETE	100	ms

NOTE: RGB INTERFACE DISPLAY SIGNAL: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]



6. OPTICAL CHARACTERISTICS

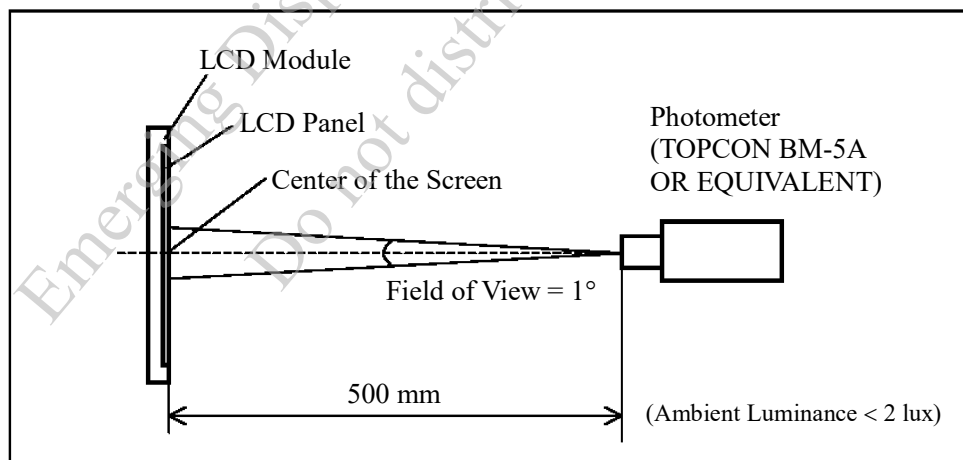
6.1 OPTICAL CHARACTERISTICS

Ta=25±2°C

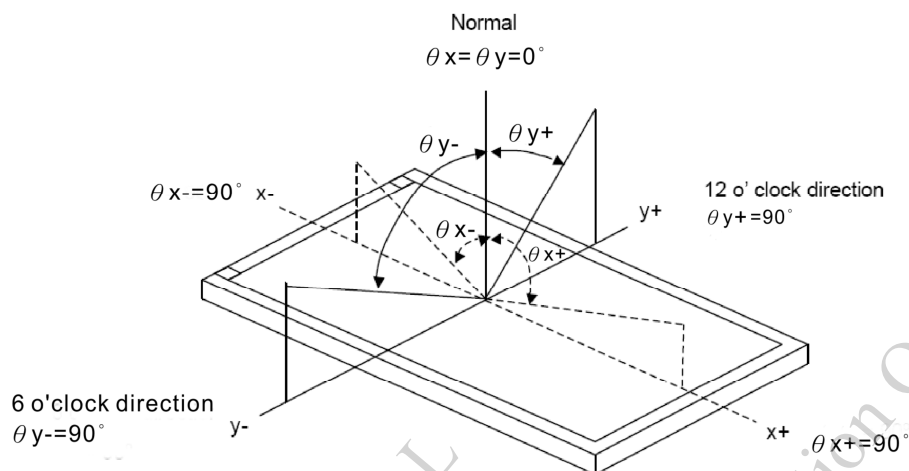
ITEM		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	REMARK
VIEWING ANGLE		θ_{y+}	CR≥10	$\theta_x=0^{\circ}$	70	80	—	deg.	NOTE (2) NOTE (3)
		θ_{y-}			70	80	—		
		θ_{x+}		$\theta_y=0^{\circ}$	70	80	—		
		θ_{x-}			70	80	—		
CONTRAST RATIO (CENTER)		CR	$\theta_x=0^{\circ}$, $\theta_y=0^{\circ}$		1000	1500	—	—	NOTE (3)
RESPONSE TIME		T _R (rise)+ T _F (fall)			—	30	40	msec	NOTE (4)
COLOR CHROMATICITY (CENTER)	WHITE	W _x	$\theta_x=0^{\circ}$, $\theta_y=0^{\circ}$ VDD-VSS=3.3V VBL+–VSS=12V		(0.27)	(0.32)	(0.37)	—	NOTE (5)
		W _y			(0.30)	(0.35)	(0.40)		
	RED	R _x			(0.54)	(0.59)	(0.64)	—	
		R _y			(0.30)	(0.35)	(0.40)		
	GREEN	G _x			(0.32)	(0.37)	(0.42)	—	
		G _y			(0.55)	(0.60)	(0.65)		
	BLUE	B _x			(0.10)	(0.15)	(0.20)	—	
		B _y			(0.04)	(0.09)	(0.14)		
THE BRIGHTNESS OF MODULE (CENTER)		B	$\theta_x=0^{\circ}$, $\theta_y=0^{\circ}$ VDD-VSS=3.3V VBL+–VSS=12V		(800)	(1000)	—	cd/m ²	NOTE (6)
THE UNIFORMITY OF MODULE		—			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.



NOTE (2) : DEFINITION OF VIEWING ANGLE :



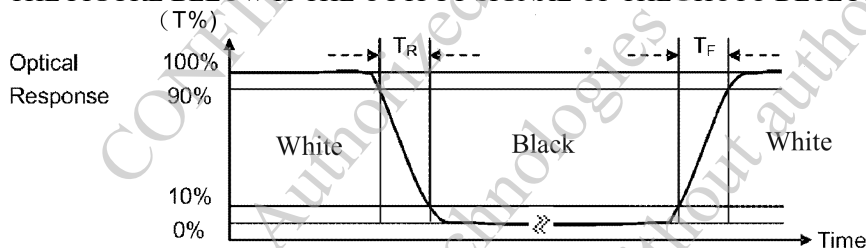
NOTE (3) : DEFINITION OF CONTRAST RATIO (CR) :

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.



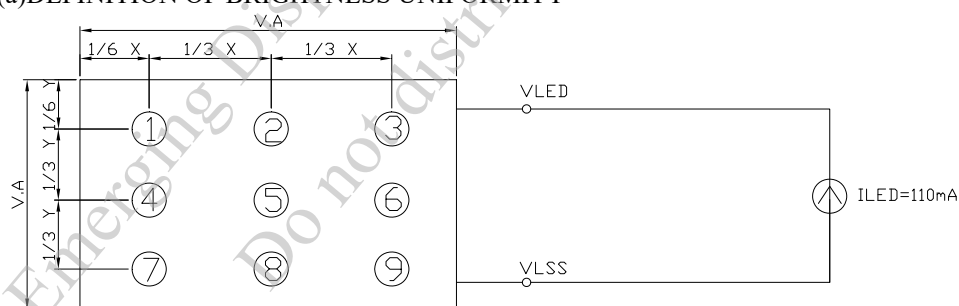
NOTE (5) : DEFINITION OF COLOR CHROMATICITY

(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

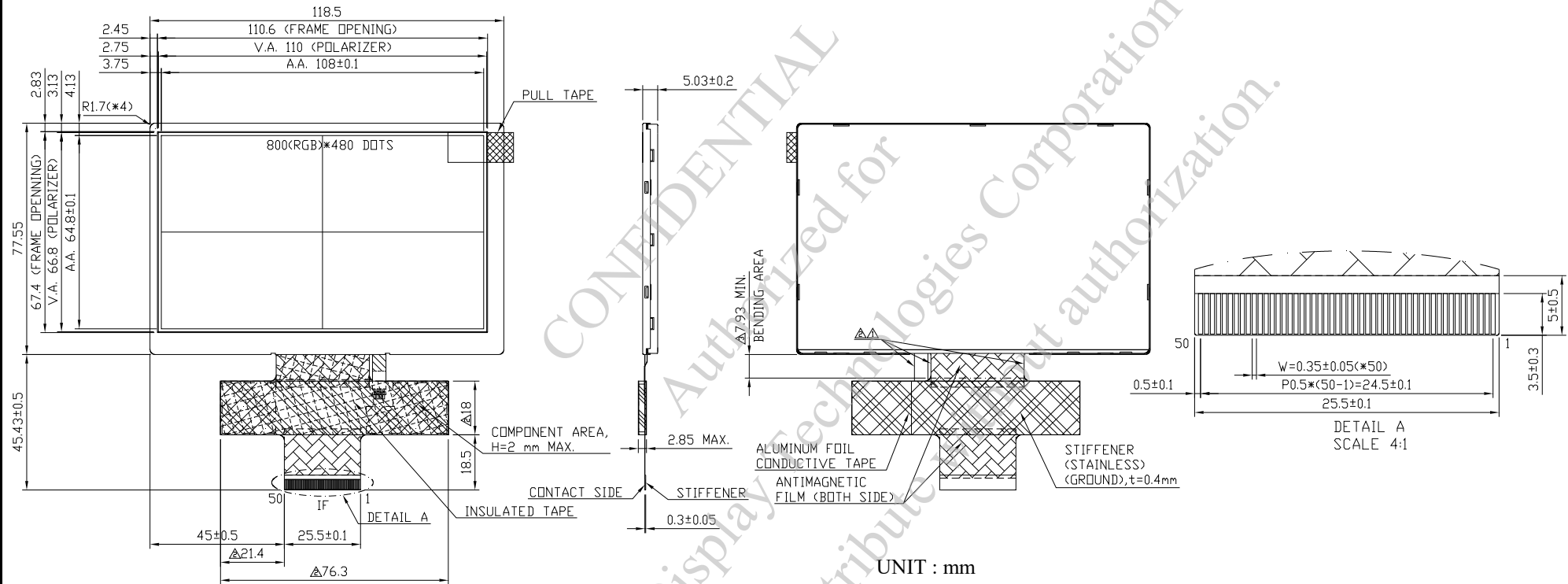


UNIT : mm

(b)THE BRIGHTNESS UNIFORMITY CALCULATING METHOD

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

7. OUTLINE DIMENSIONS



UNIT : mm

SCALE : NTS

THIRD ANGLE PROJECTION

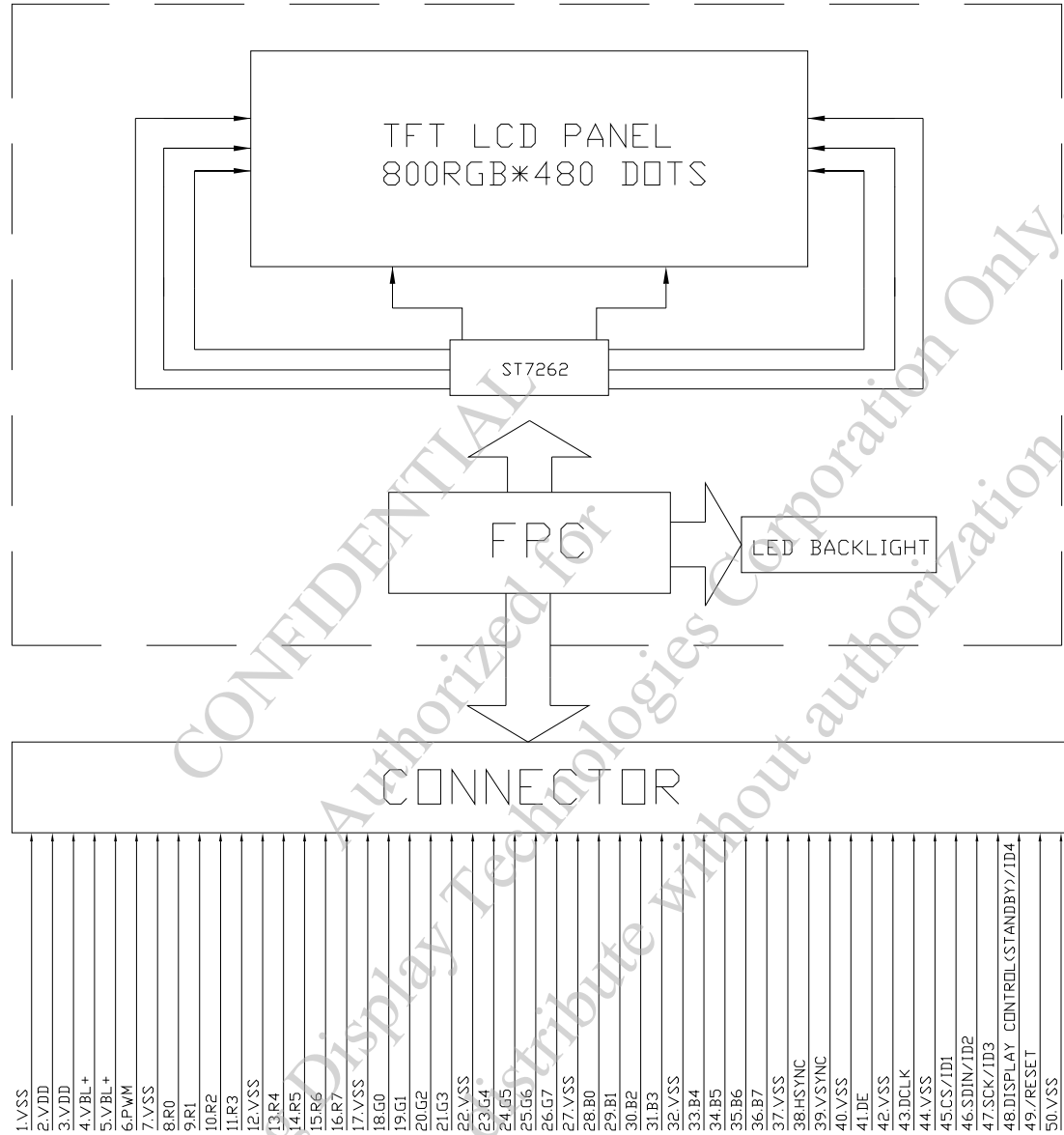
NOT SPECIFIED TOLERANCE IS ±0.3mm

MARK Δ MODIFY (NUMBER NOTE MODIFY VERSION)

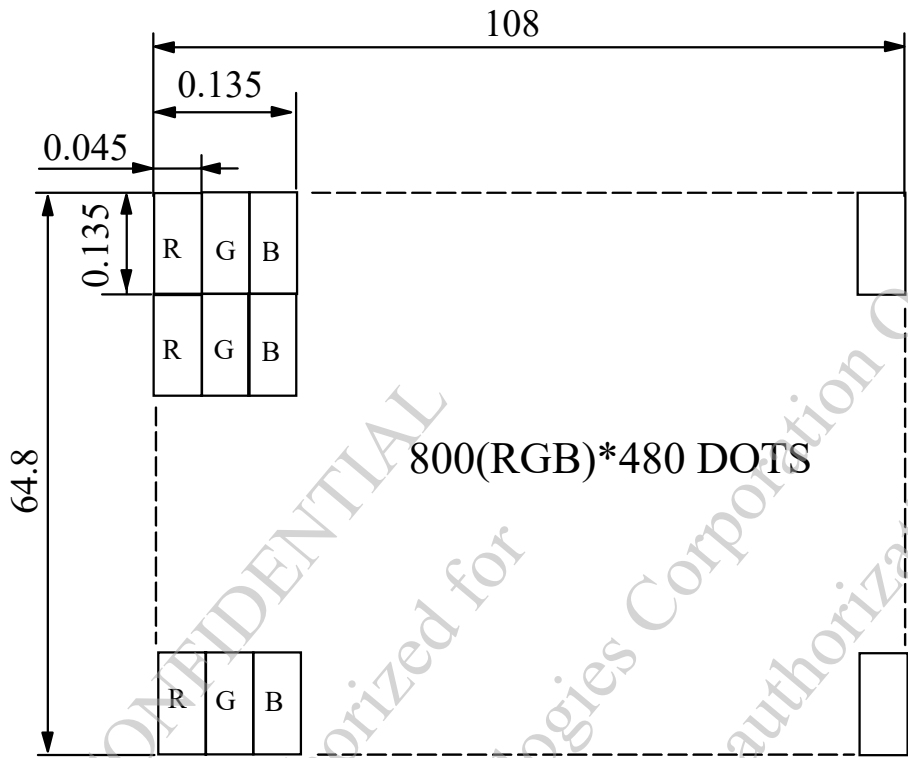
NOTE:

1. RECOMMEND MATCH CONNECTOR KYOCERA : 04 6240 050 SERIES

8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.1
DOTS MATRIX TOLERANCE IS ± 0.01

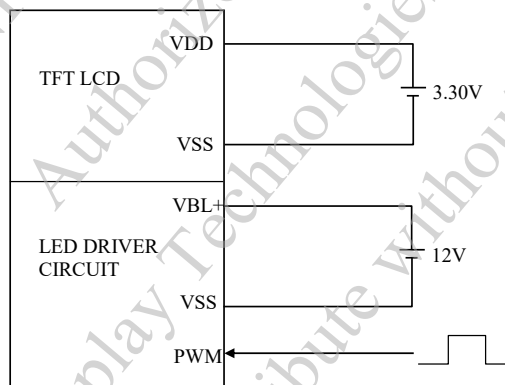
10. INTERFACE SIGNALS

PIN NO.	SYMBOL	FUNCTION
1	VSS	POWER GROUND.
2	VDD	POWER FOR DIGITAL CIRCUIT.
3	VDD	POWER FOR DIGITAL CIRCUIT.
4	VBL+	POWER SUPPLY FOR LED DRIVER CIRCUIT
5	VBL+	POWER SUPPLY FOR LED DRIVER CIRCUIT
6	PWM	DIMMING CONTROL INPUT FOR BACKLIGHT. DO NOT ALLOW THIS PIN TO FLOAT.
7	VSS	POWER GROUND.
8	R0	RED DATA.
9	R1	RED DATA.
10	R2	RED DATA.
11	R3	RED DATA.
12	VSS	POWER GROUND.
13	R4	RED DATA.
14	R5	RED DATA.
15	R6	RED DATA.
16	R7	RED DATA.
17	VSS	POWER GROUND.
18	G0	GREEN DATA.
19	G1	GREEN DATA.
20	G2	GREEN DATA.
21	G3	GREEN DATA.
22	VSS	POWER GROUND.
23	G4	GREEN DATA.
24	G5	GREEN DATA.
25	G6	GREEN DATA.
26	G7	GREEN DATA.
27	VSS	POWER GROUND.
28	B0	BLUE DATA.
29	B1	BLUE DATA.
30	B2	BLUE DATA.
31	B3	BLUE DATA.
32	VSS	POWER GROUND.
33	B4	BLUE DATA.
34	B5	BLUE DATA.
35	B6	BLUE DATA.
36	B7	BLUE DATA.
37	VSS	POWER GROUND.
38	HSYNC	HORIZONTAL SYNC SIGNAL
39	VSNC	VERTICAL SYNC SIGNAL
40	VSS	POWER GROUND.

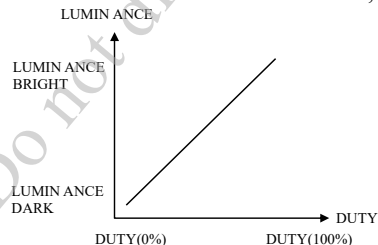
PIN NO.	SYMBOL	FUNCTION
41	DE	INPUT DATA ENABLE CONTROL, WHEN DE MODE, ACTIVE HIGH TO ENABLE DATA INPUT, NORMALLY PULL LOW
42	VSS	POWER GROUND.
43	DCLK	CLOCK SIGNAL FOR DATA LATCHING AND INTERNAL COUNTER OF THE TIMING CONTROLLER
44	VSS	POWER GROUND.
45	CS/ID1	CS FOR LCM-DRIVER SPI-PORT/ID1(SIZE INFO, NOT USED)
46	SDIN/ID2	SDIN FOR LCM-DRIVER SPI-PORT/ID2(SIZE INFO, PULL LOW TO VSS, INTERNAL: 10K Ω)
47	SCK/ID3	SCK FOR LCM-DRIVER SPI-PORT/ID3(SIZE INFO, PULL HIGH TO VDD, INTERNAL: 10K Ω)
48	DISPLAY CONTROL (STANDBY)/ID4	DISPLAY CONTROL (STANDBY)/ID4 (SIZE INFO, NOT USED)
49	/RESET	GLOBAL RESET(LOW ACTIVE).
50	VSS	POWER GROUND.

11. POWER SUPPLY

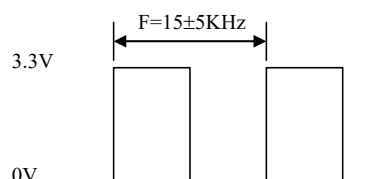
11.1 POWER SUPPLY FOR LCM



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=0~3.3V , OPERATION FREQUENCY : 15 $\pm$ 5KHz



f_{PWM} (Hz)	DMIN	DMAX
10.0k < f $\leq$ 15.0k	1.50%	100%
15.0k < f $\leq$ 20.0k	2.00%	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 : $45 \pm 5\text{cm}$

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

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

90° (FOR SECTION OUTSIDE OF VIEWING AREA), REF TO FIG.B
PERPENDICULAR TO MODULE SURFACE

VIEWING ANGLE SHOULD BE SMALLER THAN 45°

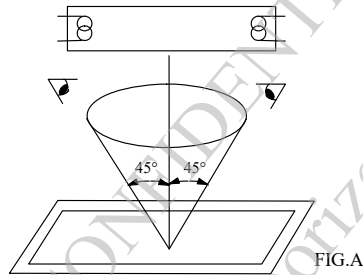


FIG.A

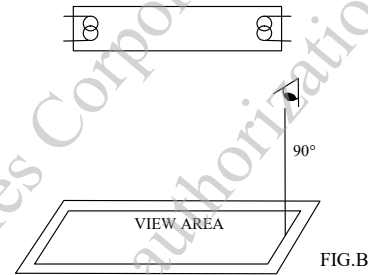


FIG.B

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° WITH RESPECT 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° WITH RESPECT 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

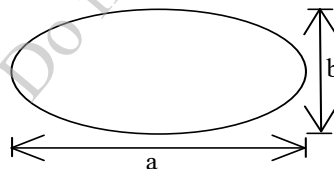
MINOR DEFECT : AQL 1.0

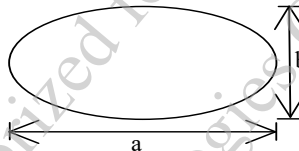
12.3 DEFECTS CLASSIFICATION

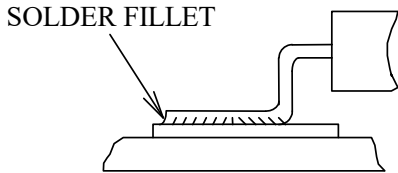
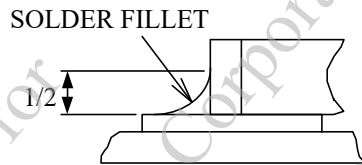
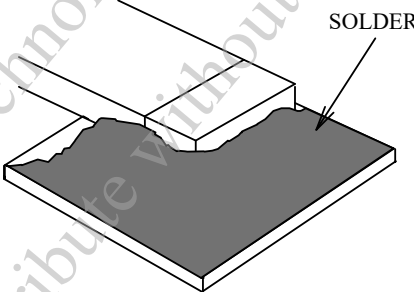
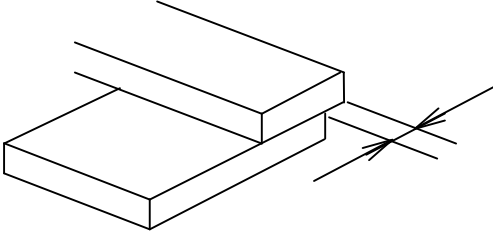
12.3.1 VISUAL DEFECTS CLASSIFICATION

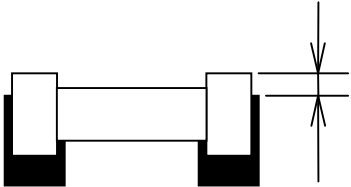
TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	• DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS - EX: DISCONNECTION, SHORT CIRCUIT ETC	0.65
	2.BACKLIGHT	• NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION	
	3.DIMENSIONS	• SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS	
MINOR DEFECT	1.DISPLAY ZONE	• BLACK/WHITE SPOT • BUBBLES ON POLARIZER • NEWTON RING • BLACK/WHITE LINE • SCRATCH • CONTAMINATION • LEVER COLOR SPREAD	1.0
	2.BEZEL ZONE	• STAINS • SCRATCHES • FOREIGN MATTER	
	3.SOLDERING	• INSUFFICIENT SOLDER • SOLDERED IN INCORRECT POSITION • CONVEX SOLDERING SPOT • SOLDER BALLS • SOLDER SCRAPS	
	4.DISPLAY ON (ALL ON)	• LIGHT LINE	

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	(1)INSPECTION PATTERN: FULL WHITE, FULL BLACK, RED, GREEN AND BLUE SCREENS. (2)<table><tr><th>ITEMS</th><th>ACCEPTABLE COUNT</th></tr><tr><td>BRIGHT DOT</td><td>$N \leq 2$</td></tr><tr><td>DARK DOT</td><td>$N \leq 3$</td></tr><tr><td>TOTAL BRIGHT AND DARK DOTS</td><td>$N \leq 4$</td></tr></table> NOTE : 1. THE DEFINITION OF DOT : THE SIZE OF A DEFECTIVE DOT OVER 1/2 OF WHOLE DOT IS REGARDED AS ONE DEFECTIVE DOT. 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. 3. DARK DOT : DOTS APPEAR DARK AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER PURE RED, GREEN, BLUE PICTURE.	ITEMS	ACCEPTABLE COUNT	BRIGHT DOT	$N \leq 2$	DARK DOT	$N \leq 3$	TOTAL BRIGHT AND DARK DOTS	$N \leq 4$				
ITEMS	ACCEPTABLE COUNT													
BRIGHT DOT	$N \leq 2$													
DARK DOT	$N \leq 3$													
TOTAL BRIGHT AND DARK DOTS	$N \leq 4$													
4	FOREIGN BLACK/WHITE/ BRIGHT LINE/ SCRATCH OF VIEWING AREA	<table><tr><th>LENGTH : L</th><th>WIDTH : W</th><th>PERMISSIBLE NO.</th></tr><tr><td>$L \leq 0.3$</td><td>$W \leq 0.05$</td><td>IGNORE</td></tr><tr><td>$0.3 < L \leq 3.0$</td><td>$0.05 < W \leq 0.1$</td><td>4</td></tr><tr><td>$3.0 < L$</td><td>$0.1 < W$</td><td>NONE</td></tr></table> WIDTH : W mm, LENGTH : L mm	LENGTH : L	WIDTH : W	PERMISSIBLE NO.	$L \leq 0.3$	$W \leq 0.05$	IGNORE	$0.3 < L \leq 3.0$	$0.05 < W \leq 0.1$	4	$3.0 < L$	$0.1 < W$	NONE
LENGTH : L	WIDTH : W	PERMISSIBLE NO.												
$L \leq 0.3$	$W \leq 0.05$	IGNORE												
$0.3 < L \leq 3.0$	$0.05 < W \leq 0.1$	4												
$3.0 < L$	$0.1 < W$	NONE												
5	FOREIGN MATTER \ BLACK SPOTS \ WHITE SPOTS \ DENT (INCLUDING LIGHT LEAKAGE DUE TO POLARIZING PLATES PINHOLES, ETC.)	<table><tr><th>AVERAGE DIAMETER (mm): D</th><th>NUMBER OF PIECES PERMITTED</th></tr><tr><td>$D \leq 0.15$</td><td>IGNORE</td></tr><tr><td>$0.15 < D \leq 0.5$</td><td>4</td></tr><tr><td>$0.5 < D$</td><td>NONE</td></tr></table> NOTE : DIAMETER $D=(a+b)/2$ 	AVERAGE DIAMETER (mm): D	NUMBER OF PIECES PERMITTED	$D \leq 0.15$	IGNORE	$0.15 < D \leq 0.5$	4	$0.5 < D$	NONE				
AVERAGE DIAMETER (mm): D	NUMBER OF PIECES PERMITTED													
$D \leq 0.15$	IGNORE													
$0.15 < D \leq 0.5$	4													
$0.5 < D$	NONE													

NO.	ITEM	CRITERIA																				
6	BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS	<table><tr><td></td><td>AVERAGE DIAMETER (mm) : D</td><td>NUMBER OF PIECES PERMITTED</td></tr><tr><td rowspan="3">BUBBLE ON THE POLARIZER</td><td>$D \leq 0.25$</td><td>LGNORE</td></tr><tr><td>$0.25 < D \leq 0.5$</td><td>$N \leq 5$</td></tr><tr><td>$0.5 < D$</td><td>NONE</td></tr><tr><td rowspan="2">SURFACE STAINS</td><td>$D < 0.1$</td><td>IGNORE</td></tr><tr><td>$0.1 < D \leq 0.3$</td><td>$N \leq 3$</td></tr><tr><td rowspan="2">CF FAIL / SPOT</td><td>$D < 0.1$</td><td>IGNORE</td></tr><tr><td>$0.1 < D \leq 0.3$</td><td>$N \leq 3$</td></tr></table>		AVERAGE DIAMETER (mm) : D	NUMBER OF PIECES PERMITTED	BUBBLE ON THE POLARIZER	$D \leq 0.25$	LGNORE	$0.25 < D \leq 0.5$	$N \leq 5$	$0.5 < D$	NONE	SURFACE STAINS	$D < 0.1$	IGNORE	$0.1 < D \leq 0.3$	$N \leq 3$	CF FAIL / SPOT	$D < 0.1$	IGNORE	$0.1 < D \leq 0.3$	$N \leq 3$
			AVERAGE DIAMETER (mm) : D	NUMBER OF PIECES PERMITTED																		
		BUBBLE ON THE POLARIZER	$D \leq 0.25$	LGNORE																		
			$0.25 < D \leq 0.5$	$N \leq 5$																		
			$0.5 < D$	NONE																		
		SURFACE STAINS	$D < 0.1$	IGNORE																		
			$0.1 < D \leq 0.3$	$N \leq 3$																		
		CF FAIL / SPOT	$D < 0.1$	IGNORE																		
			$0.1 < D \leq 0.3$	$N \leq 3$																		
		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. (2)THE EXTRANEIOUS SUBSTANCE IS DEFINED AS IT CAN BE OBSERVED WHEN THE MODULE IS POWER ON. (3)THE DEFINITION OF AVERAGE DIAMETER, D IS DEFINED AS FOLLOWING. AVERAGE DIAMETER (D)=(a+b)/2																				
																						
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	(1)BEZEL MAY NOT HAVE RUST, BE DEFORMED OR HAVE FINGER PRINTS STAINS OF OTHER CONTAMINATION. (2)BEZEL MUST COMPLY WITH JOB SPECIFICATIONS.																				
11	PCB	(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. (2)NO OXIDATION OR CONTAMINATION PCB TERMINALS. (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. (4)THE JUMPER ON THE PCB SHOULD CONFORM TO THE PRODUCT CHARACTERISTIC CHART. (5)IF SOLDER GETS ON BEZEL TAB PADS, LED PAD, ZEBRA PAD OR SCREW HOLD PAD; MAKE SURE IT IS SMOOTHED DOWN.																				

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

NO.	ITEM	CRITERIA
12	SOLDERING	(b)CHIP COMPONENT COMPONENT IS OFF CENTER, AND MORE THAN 50% OF THE LEADS IS OFF THE PAD OUTLINE  (4)NO UNMELTED SOLDER PASTE MAY BE PRESENT ON THE PCB. (5)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.
13	BACKLIGHT	(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.
14	GENERAL APPEARANCE	(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.

NO.	ITEM	CRITERIA											
15	CRACKED GLASS	THE LCD WITH EXTENSIVE CRACK IS NOT ACCEPTABLE											
		GENERAL GLASS CHIP :	<table><tr><td>a</td><td>b</td><td>c</td></tr><tr><td>$\leq t/2$</td><td>< VIEWING AREA</td><td>$\leq 1/8X$</td></tr><tr><td>$t/2 > , \leq 2t$</td><td>$\leq W/2$</td><td>$\leq 1/8X$</td></tr></table> *W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE X = LCD SIDE LENGTH t = GLASS THICKNESS		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	$\leq 1/8X$									
$t/2 > , \leq 2t$	$\leq W/2$	$\leq 1/8X$											
CORNER PART :	<table><tr><td>a</td><td>b</td><td>c</td></tr><tr><td>$\leq t/2$</td><td>< VIEWING AREA</td><td>$\leq 1/8X$</td></tr><tr><td>$> t/2 , \leq 2t$</td><td>$\leq W/2$</td><td>$\leq 1/8X$</td></tr></table> *W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE X = LCD SIDE LENGTH t = GLASS THICKNESS		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	$\leq 1/8X$											
$> t/2 , \leq 2t$	$\leq W/2$	$\leq 1/8X$											
CHIP ON ELECTRODE PAD	<table><tr><td>a</td><td>b</td><td>c</td></tr><tr><td>$\leq t$</td><td>$\leq 0.5\text{mm}$</td><td>$\leq 1/8X$</td></tr></table> * X=LCD SIDE WIDTH t=GLASS THICKNESS		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><tr><td>a</td><td>b</td><td>c</td></tr><tr><td>$\leq t$</td><td>$\leq 1/8X$</td><td>$\leq L$</td></tr></table> *X=LCD SIDE WIDTH t = GLASS THICKNESS L=ELECTRODE PAD LENGTH ①IF GLASS CHIPPING THE ITO TERMINAL, OVER 2/3 OF THE ITO MUST REMAIN AND BE, INSPECTED ACCORDING TO ELECTRODE TERMINAL SPECIFICATIONS ②IF THE PRODUCT WILL BE HEAT SEALED BY THE CUSTOMER, THE ALIGNMENT MARK MUST NOT BE DAMAGED		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 OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +80°C FOR 240 HRS
2	LOW TEMPERATURE OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -30°C FOR 240 HRS
3	HIGH TEMPERATURE STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +80°C FOR 240 HRS
4	LOW TEMPERATURE STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -30°C FOR 240 HRS
5	HIGH TEMPERATURE /HUMIDITY TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 60°C, 90% RH 240 HRS
6	THERMAL SHOCK (NOT OPERATED)	THE SAMPLE SHOULD BE ALLOWED TO STAND THE FOLLOWING 10 CYCLES OF OPERATION :
7	ESD (ELECTROSTATIC DISCHARGE) (NOT OPERATED)	AIR DISCHARGE $\pm 12KV$ CONTACT DISCHARGE $\pm 8KV$ (ACCORDING TO 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) : 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 50%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 50%, THEN THERE IS A POSSIBILITY OF DISTORTION AND IRREGULARITY OF THE PICTURE DUE TO LIQUID CRYSTAL BEHAVIOR.

13.2 TESTING CONDITIONS AND INSPECTION CRITERIA

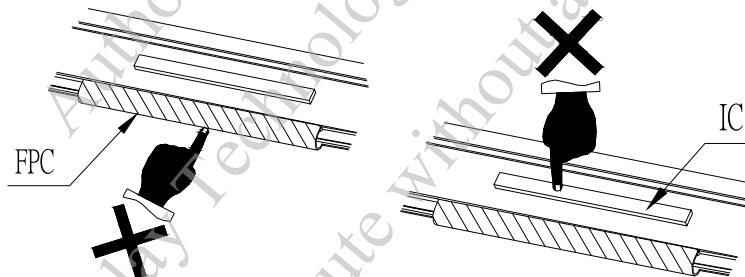
FOR THE FINAL TEST THE TESTING SAMPLE MUST BE STORED AT ROOM TEMPERATURE FOR 24 HOURS, AFTER THE TESTS LISTED IN TABLE 13.1, STANDARD SPECIFICATIONS FOR RELIABILITY HAVE BEEN EXECUTED IN ORDER TO ENSURE STABILITY.

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 NOTICE

- 14.2.1 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.
- 14.2.2 DO NOT DISASSEMBLE. EDT SHALL NOT BE HELD RESPONSIBLE IF THE MODULE IS DISASSEMBLED AND UPON THE REASSEMBLY THE MODULE FAILED.
- 14.2.3 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.
- 14.2.4 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.
- 14.2.5 DON'T GIVE EXTERNAL SHOCK.
- 14.2.6 DON'T APPLY EXCESSIVE FORCE ON THE SURFACE.
- 14.2.7 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.
- 14.2.8 DON'T OPERATE IT ABOVE THE ABSOLUTE MAXIMUM RATING.
- 14.2.9 STORAGE IN A CLEAN ENVIRONMENT, FREE FROM DUST, ACTIVE GAS, AND SOLVENT.
- 14.2.10 STORE WITHOUT ANY PHYSICAL LOAD.
- 14.2.11 REWIRING: NO MORE THAN 3 TIMES.