

EXAMINED BY :	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-0008693
Sam Chou		ISSUE : FEB.15, 2019
APPROVED BY :		TOTAL PAGE : 22
<i>Chris Wu</i>		VERSION : 2

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :
ET070018DBA
(GP)
FOR MESSRS. :

CUSTOMER'S APPROVAL

DATE : _____

BY : _____

CONFIDENTIAL
Authorized for Corporation Only.
Emerging Display Technology Corporation
Do not distribute without authorization.

RECORDS OF REVISION DOC . FIRST ISSUE
AUG.23, 2018

DATE	REVISED PAGE NO.	SUMMARY																																																																																																																														
FEB.15, 2019	2	3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS NOTE (3) : THE PWM DUTY CYCLE OF THE LED BACKLIGHT SHOULD BE ADJUSTED TO BE LESS THAN 60%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 60% . →THE PWM DUTY CYCLE OF THE LED BACKLIGHT SHOULD BE ADJUSTED TO BE LESS THAN 40%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 40% .																																																																																																																														
	3	4. ELECTRICAL CHARACTERISTICS <table border="1" style="width: 100%;"> <thead> <tr> <th>ITEM</th> <th>TYP.</th> <th>MAX.</th> <th>ITEM</th> <th>TYP.</th> <th>MAX.</th> </tr> </thead> <tbody> <tr> <td>POWER SUPPLY CURRENT FOR LED DRIVER</td> <td>(496)</td> <td>(645)</td> <td>POWER SUPPLY CURRENT FOR LED DRIVER</td> <td>496</td> <td>645</td> </tr> </tbody> </table>	ITEM	TYP.	MAX.	ITEM	TYP.	MAX.	POWER SUPPLY CURRENT FOR LED DRIVER	(496)	(645)	POWER SUPPLY CURRENT FOR LED DRIVER	496	645																																																																																																																		
ITEM	TYP.	MAX.	ITEM	TYP.	MAX.																																																																																																																											
POWER SUPPLY CURRENT FOR LED DRIVER	(496)	(645)	POWER SUPPLY CURRENT FOR LED DRIVER	496	645																																																																																																																											
	7	6.1 OPTICAL CHARACTERISTICS <table border="1" style="width: 100%;"> <thead> <tr> <th>ITEM</th> <th>SYMBOL</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> <th>ITEM</th> <th>SYMBOL</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> </tr> </thead> <tbody> <tr> <td>CONTRAST RATIO (CENTER)</td> <td>CR</td> <td>(600)</td> <td>(800)</td> <td>—</td> <td>CONTRAST RATIO (CENTER)</td> <td>CR</td> <td>600</td> <td>800</td> <td>—</td> </tr> <tr> <td rowspan="3">COLOR</td> <td>WHITE</td> <td>Wx</td> <td>(0.28)</td> <td>(0.33)</td> <td>(0.38)</td> <td rowspan="3">COLOR</td> <td>WHITE</td> <td>Wx</td> <td>0.27</td> <td>0.32</td> <td>0.37</td> </tr> <tr> <td></td> <td>Wy</td> <td>(0.34)</td> <td>(0.39)</td> <td>(0.44)</td> <td></td> <td>Wy</td> <td>0.31</td> <td>0.36</td> <td>0.41</td> </tr> <tr> <td>RED</td> <td>Rx</td> <td>(0.55)</td> <td>(0.60)</td> <td>(0.65)</td> <td>RED</td> <td>Rx</td> <td>0.55</td> <td>0.60</td> <td>0.65</td> </tr> <tr> <td rowspan="3">CHROMATICITY (CENTER)</td> <td></td> <td>Ry</td> <td>(0.30)</td> <td>(0.35)</td> <td>(0.40)</td> <td rowspan="3">CHROMATICITY (CENTER)</td> <td></td> <td>Ry</td> <td>0.30</td> <td>0.35</td> <td>0.40</td> </tr> <tr> <td>GREEN</td> <td>Gx</td> <td>(0.29)</td> <td>(0.34)</td> <td>(0.39)</td> <td>GREEN</td> <td>Gx</td> <td>0.29</td> <td>0.34</td> <td>0.39</td> </tr> <tr> <td></td> <td>Gy</td> <td>(0.59)</td> <td>(0.64)</td> <td>(0.69)</td> <td></td> <td>Gy</td> <td>0.59</td> <td>0.64</td> <td>0.69</td> </tr> <tr> <td></td> <td>BLUE</td> <td>Bx</td> <td>(0.09)</td> <td>(0.14)</td> <td>(0.19)</td> <td></td> <td>Bx</td> <td>0.09</td> <td>0.14</td> <td>0.19</td> </tr> <tr> <td></td> <td></td> <td>By</td> <td>(0.02)</td> <td>(0.07)</td> <td>(0.12)</td> <td></td> <td>By</td> <td>0.02</td> <td>0.07</td> <td>0.12</td> </tr> <tr> <td>THE BRIGHTNESS OF MODULE (CENTER)</td> <td>B</td> <td>(1000)</td> <td>(1050)</td> <td>—</td> <td>THE BRIGHTNESS OF MODULE (CENTER)</td> <td>B</td> <td>1000</td> <td>1050</td> <td>—</td> </tr> <tr> <td>THE UNIFORMITY OF MODULE</td> <td>—</td> <td>(70)</td> <td>—</td> <td>—</td> <td>THE UNIFORMITY OF MODULE</td> <td>—</td> <td>70</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	ITEM	SYMBOL	MIN.	TYP.	MAX.	ITEM	SYMBOL	MIN.	TYP.	MAX.	CONTRAST RATIO (CENTER)	CR	(600)	(800)	—	CONTRAST RATIO (CENTER)	CR	600	800	—	COLOR	WHITE	Wx	(0.28)	(0.33)	(0.38)	COLOR	WHITE	Wx	0.27	0.32	0.37		Wy	(0.34)	(0.39)	(0.44)		Wy	0.31	0.36	0.41	RED	Rx	(0.55)	(0.60)	(0.65)	RED	Rx	0.55	0.60	0.65	CHROMATICITY (CENTER)		Ry	(0.30)	(0.35)	(0.40)	CHROMATICITY (CENTER)		Ry	0.30	0.35	0.40	GREEN	Gx	(0.29)	(0.34)	(0.39)	GREEN	Gx	0.29	0.34	0.39		Gy	(0.59)	(0.64)	(0.69)		Gy	0.59	0.64	0.69		BLUE	Bx	(0.09)	(0.14)	(0.19)		Bx	0.09	0.14	0.19			By	(0.02)	(0.07)	(0.12)		By	0.02	0.07	0.12	THE BRIGHTNESS OF MODULE (CENTER)	B	(1000)	(1050)	—	THE BRIGHTNESS OF MODULE (CENTER)	B	1000	1050	—	THE UNIFORMITY OF MODULE	—	(70)	—	—	THE UNIFORMITY OF MODULE	—	70	—	—
ITEM	SYMBOL	MIN.	TYP.	MAX.	ITEM	SYMBOL	MIN.	TYP.	MAX.																																																																																																																							
CONTRAST RATIO (CENTER)	CR	(600)	(800)	—	CONTRAST RATIO (CENTER)	CR	600	800	—																																																																																																																							
COLOR	WHITE	Wx	(0.28)	(0.33)	(0.38)	COLOR	WHITE	Wx	0.27	0.32	0.37																																																																																																																					
		Wy	(0.34)	(0.39)	(0.44)			Wy	0.31	0.36	0.41																																																																																																																					
	RED	Rx	(0.55)	(0.60)	(0.65)		RED	Rx	0.55	0.60	0.65																																																																																																																					
CHROMATICITY (CENTER)		Ry	(0.30)	(0.35)	(0.40)	CHROMATICITY (CENTER)		Ry	0.30	0.35	0.40																																																																																																																					
	GREEN	Gx	(0.29)	(0.34)	(0.39)		GREEN	Gx	0.29	0.34	0.39																																																																																																																					
		Gy	(0.59)	(0.64)	(0.69)			Gy	0.59	0.64	0.69																																																																																																																					
	BLUE	Bx	(0.09)	(0.14)	(0.19)		Bx	0.09	0.14	0.19																																																																																																																						
		By	(0.02)	(0.07)	(0.12)		By	0.02	0.07	0.12																																																																																																																						
THE BRIGHTNESS OF MODULE (CENTER)	B	(1000)	(1050)	—	THE BRIGHTNESS OF MODULE (CENTER)	B	1000	1050	—																																																																																																																							
THE UNIFORMITY OF MODULE	—	(70)	—	—	THE UNIFORMITY OF MODULE	—	70	—	—																																																																																																																							
	20	13.1 STANDARD SPECIFICATIONS FOR RELIABILITY OF LCD MODULE NOTE (2) : THE PWM DUTY CYCLE OF THE LED BACKLIGHT SHOULD BE ADJUSTED TO BE LESS THAN 60%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 60%→THE PWM DUTY CYCLE OF THE LED BACKLIGHT SHOULD BE ADJUSTED TO BE LESS THAN 40%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 40%																																																																																																																														

TABLE OF CONTENTS

NO.	ITEM	PAGE
1.	GENERAL SPECIFICATIONS -----	1
2.	MECHANICAL SPECIFICATIONS -----	1
3.	ABSOLUTE MAXIMUM RATINGS -----	2
4.	ELECTRICAL CHARACTERISTICS -----	3
5.	TIMING CHARACTERISTICS -----	4 ~ 6
6.	OPTICAL CHARACTERISTICS -----	7, 8
7.	OUTLINE DIMENSIONS -----	9
8.	BLOCK DIAGRAM -----	10
9.	DETAIL DRAWING OF DOT MATRIX -----	11
10.	INTERFACE SIGNALS -----	12
11.	POWER SUPPLY -----	13
12.	INSPECTION CRITERION -----	14 ~ 19
13.	RELIABILITY TEST -----	20
14.	CAUTION -----	21, 22

CONFIDENTIAL
Authorized for
Emerging Display Technologies Corporation Only.
Do not distribute without authorization.

1. GENERAL SPECIFICATIONS

1.1 MATERIAL SAFETY DESCRIPTION

ASSEMBLIES SHALL COMPLY WITH EDT GREEN PRODUCT (GP) REQUIREMENTS, INCLUDING PROHIBITED MATERIALS/COMPONENTS CONTAINING LEAD, MERCURY, CADMIUM, HEXAVALENT CHROMIUM, POLYBROMINATED BIPHENYLS (PBB), POLYBROMINATED DIPHENYL ETHERS (PBDE), POLYCHLORINATED BIPHENYLS (PCB) CATEGORY, POLYCHLORINATED NAPHTHALENE (PCN) CATEGORY, POLYCHLORINATED TERPHENYLS (PCT) CATEGORY, CHLORINATED PARAFFINS (CP) CATEGORY, TRIBUTHYL TIN CATEGORY / TRIPHENYL TIN CATEGORY, ASBESTOS, SPECIFIC AZO COMPOUNDS, FORMALDEHYDE, POLYVINYL CHLORIDE (PVC) AND PVC BLENDS, OTHER BROMINATED ORGANIC COMPOUNDS AND OTHER CHLORINATED ORGANIC COMPOUNDS.

2. MECHANICAL SPECIFICATIONS

- (1) DISPLAY SIZE ----- 7 inch
- (2) NUMBER OF DOTS ----- 800W * (RGB) * 480H DOTS
- (3) MODULE SIZE ----- 165W * 104.44H *9.85D(MAX.) mm
- (4) VIEWING AREA ----- 153.8W * 92.84H mm
- (5) ACTIVE AREA ----- 152.4W * 91.44H mm
- (6) DOT SIZE ----- 0.0635W * 0.1905H mm
- (7) PIXEL SIZE ----- 0.1905W * 0.1905H mm
- (8) LCD TYPE ----- TFT, TRANSMISSIVE,
NORMALLY BLACK
- (9) COLOR ----- 16.7M (8bit)
- (10) VIEWING DIRECTION ----- SUPER WIDE VIEW
- (11) BACK LIGHT ----- LED, COLOR : WHITE
- (12) INTERFACE MODE ----- LVDS

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	3	3.6	V	
	VCC-VSS	9.0	15.0	V	
LVDS DRIVER OUTPUT VOLTAGE	—	-0.3	VDD+0.3	V	
STATIC ELECTRICITY	—	—	—	V	NOTE (1)

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

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-30°C	85°C	-30°C	85°C	NOTE (1) ; (2) ; (3)
HUMIDITY	NOTE (4)		NOTE (4)		WITHOUT CONDENSATION
VIBRATION	—	2.45 m/s ² (0.25G)	—	11.76m/s ² (1.2G)	10~100 Hz XYZ DIRECTIONS 1 HR EACH
SHOCK	—	29.4 m/s ² (3G)	—	490.0 m/s ² (50G)	10 ms XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (1) : Ta AT -30°C : WILL BE 48HRS MAX.

85°C : WILL BE 48HRS MAX.

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

NOTE (3) : 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 40%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 40%, THEN THERE IS A POSSIBILITY OF DISTORTION AND IRREGULARITY OF THE PICTURE DUE TO LIQUID CRYSTAL BEHAVIOR.

NOTE (4) : Ta ≤ 40°C : 90%RH MAX. (96HRS MAX).

Ta > 40°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 40°C (96HRS MAX).

4. ELECTRICAL CHARACTERISTICS

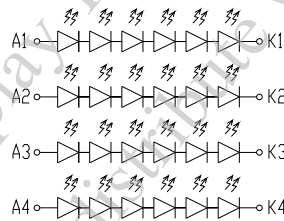
Ta = 25 °C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3.0	3.3	3.6	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VCC-VSS	—	9.0	12.0	15.0	V	
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	220	270	mA	NOTE (1)
POWER SUPPLY CURRENT FOR LED DRIVER	ICC	VCC-VSS=12.0V	—	496	645	mA	
LVDS DIFFERENTIAL INPUT HIGH THRESHOLD	VTH	VOC=+1.2V	—	—	100	mV	
LVDS DIFFERENTIAL INPUT LOW THRESHOLD	VTL		-100	—	—	mV	
LOW LEVEL INPUT VOLTAGE	VIL	—	VSS	—	0.3*VDD	V	NOTE (2)
HIGH LEVEL INPUT VOLTAGE	VIH	—	0.7*VDD	—	VDD	V	
LVDS CLK FREQUENCY	—	VDD-VSS=3.3V	20	—	85	MHz	
FRAME FREQUENCY	fFRAME	—	50	60	72	Hz	
LED LIFE TIME	—	I _{LED} =60mA (PER LED)	50K	—	—	hrs	NOTE (4) NOTE (5)

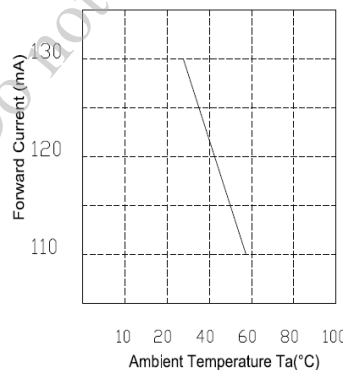
NOTE (1) : THE DISPLAY PATTERN IS ALL “WHITE”.

NOTE (2) : APPLIED TO TERMINALS U/D , L/R , R0~R5 , G0~G5 , B0~B5 , HSYNC , VSYNC , ENB , DCLK.

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

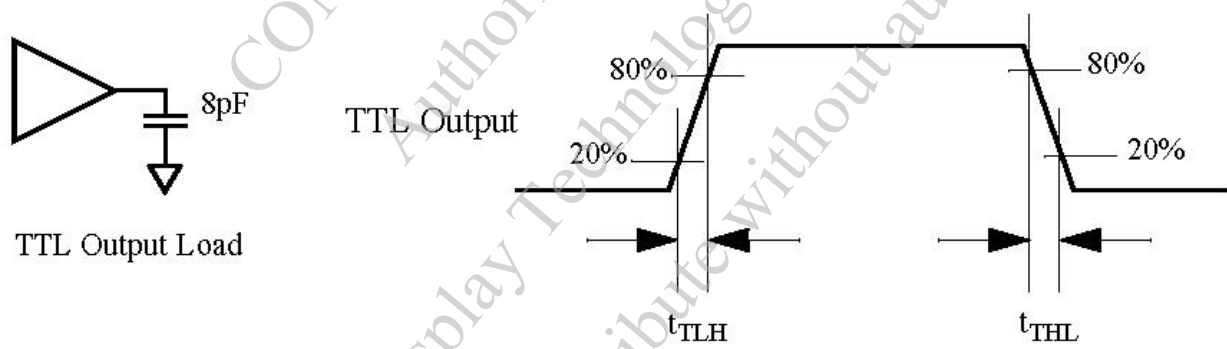
LCD LUMINANCE BECOMES HALF OF THE INITIAL VALUE.

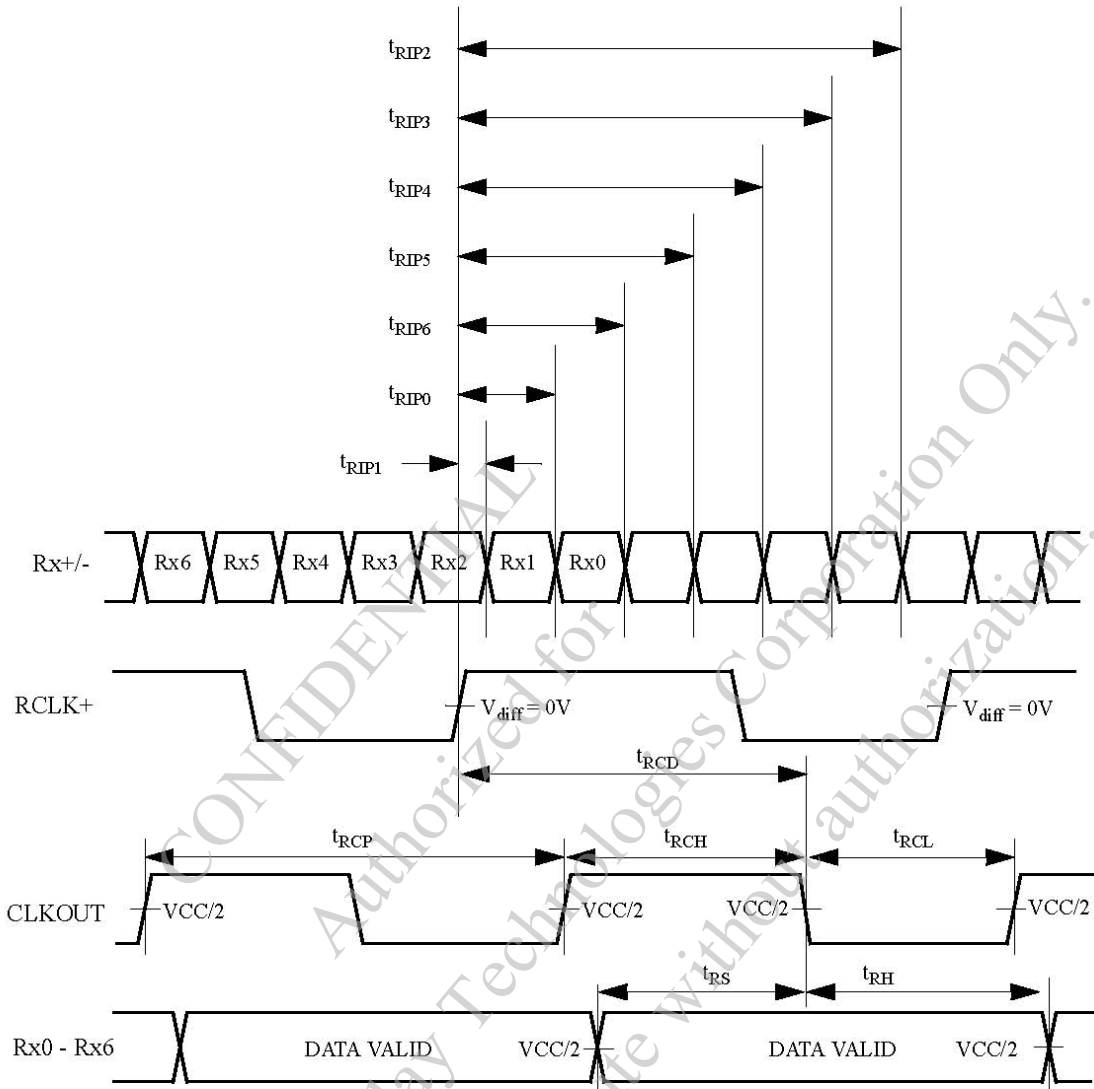
5. TIMING CHARACTERISTICS

5.1 SWITCHING CHARACTERISTICS AND AC TIMING DIAGRAMS (LVDS)

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLK OUT PERIOD	t_{RCP}	11.76	T	50.0	ns
CLK OUT HIGH TIME	t_{RCH}	—	4T/7	—	ns
CLK OUT LOW TIME	t_{RCL}	—	3T/7	—	ns
RCLK +/- TO CLK OUT DELAY	t_{RCD}	—	5T/7	—	ns
TTL DATA SETUP TO CLK OUT	t_{RS}	0.35T-0.3	—	—	ns
TTL DATA HOLD FROM CLK OUT	t_{RH}	0.45T-1.6	—	—	ns
TTL LOW TO HIGH TRANSITION TIME	t_{TLH}	—	2.0	3.0	ns
TTL HIGH TO LOW TRANSITION TIME	t_{THL}	—	1.8	3.0	ns
INPUT DATA POSITION0 (T=11.76ns)	t_{RIP1}	-0.4	0.0	0.4	ns
INPUT DATA POSITION1 (T=11.76ns)	t_{RIP0}	T/7-0.4	T/7	T/7+0.4	ns
INPUT DATA POSITION2 (T=11.76ns)	t_{RIP6}	2T/7-0.4	2T/7	2T/7+0.4	ns
INPUT DATA POSITION3 (T=11.76ns)	t_{RIP5}	3T/7-0.4	3T/7	3T/7+0.4	ns
INPUT DATA POSITION4 (T=11.76ns)	t_{RIP4}	4T/7-0.4	4T/7	4T/7+0.4	ns
INPUT DATA POSITION5 (T=11.76ns)	t_{RIP3}	5T/7-0.4	5T/7	5T/7+0.4	ns
INPUT DATA POSITION6 (T=11.76ns)	t_{RIP2}	6T/7-0.4	6T/7	6T/7+0.4	ns
PHASE LOCK LOOP SET	t_{RPLL}	—	—	10.0	ms

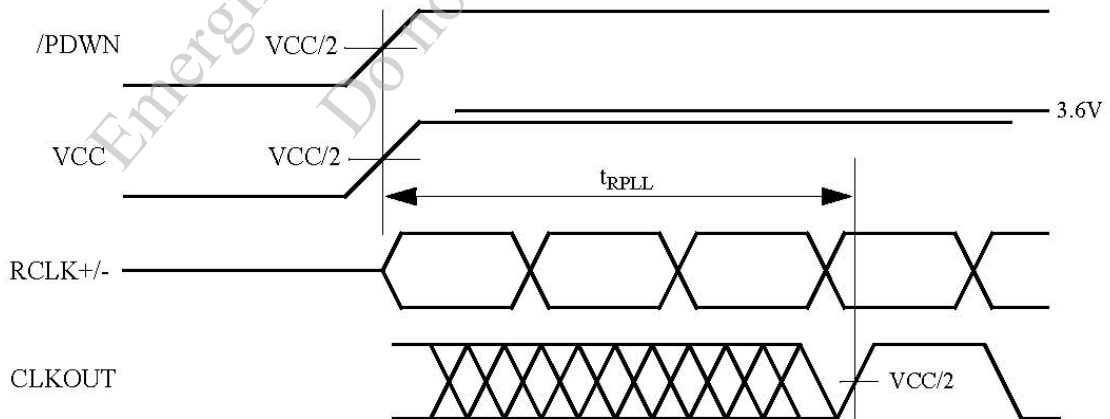
TTL OUTPUT



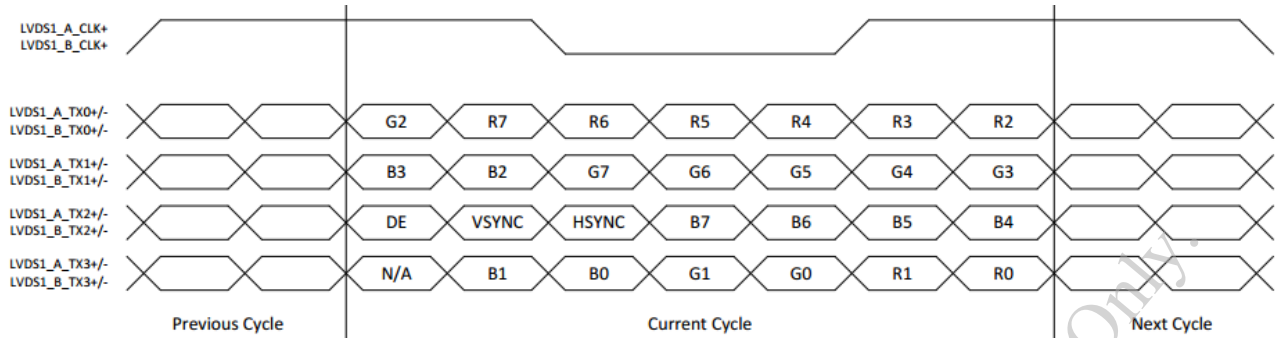


Note:
1) $V_{diff} = (RA+) - (RA-), \dots, (RCLK+) - (RCLK-)$

PHASE LOCK LOOP SET TIME



5.2 LVDS DATA FORMAT



5.3 TIMING

DE MODE

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
CLK FREQUENCY	F_{CLK}	25.2	25.4	35.7	MHz	FRAME RATE =60Hz
HORIZONTAL DISPLAY AREA	T_{HD}		800		CLK	
HS PERIOD TIME	T_H	860	864	974	CLK	
HS BLANKING	$T_{HFP} + T_{HBP}$	60	64	174	CLK	
VERTICAL DISPLAY AREA	T_{VD}		480		H	
VS PERIOD TIME	T_V	488	490	611	H	
VS BLANKING	$T_{VBP} + T_{VFP}$	8	10	131	H	

HV MODE

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLK FREQUENCY	F_{CLK}	25.2	25.4	35.7	MHz
HORIZONTAL DISPLAY AREA	T_{HD}		800		CLK
HS PERIOD TIME	T_H	860	864	974	CLK
HS PULSE WIDTH	T_{HPW}	1	2	40	CLK
HS BACK PORCH	T_{HBP}		32		CLK
HS FRONT PORCH	T_{HFP}	28	32	142	CLK
VERTICAL DISPLAY AREA	T_{VD}		480		H
VS PERIOD TIME	T_V	488	490	611	H
VS PULSE WIDTH	T_{VPW}	1	2	20	H
VS BACK PORCH	T_{VBP}		5		H
VS FRONT PORCH	T_{VFP}	3	5	126	H

6. OPTICAL CHARACTERISTICS (NOTE 1)

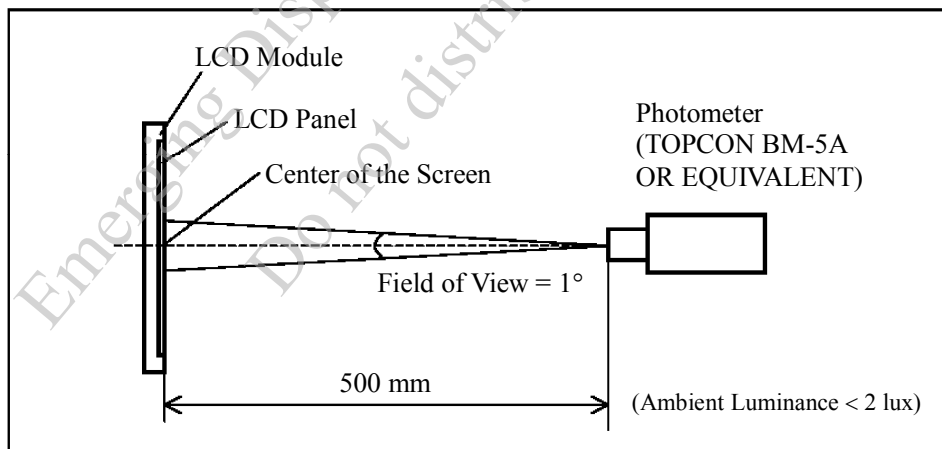
6.1 OPTICAL CHARACTERISTICS

Ta = 25 ± 2 °C

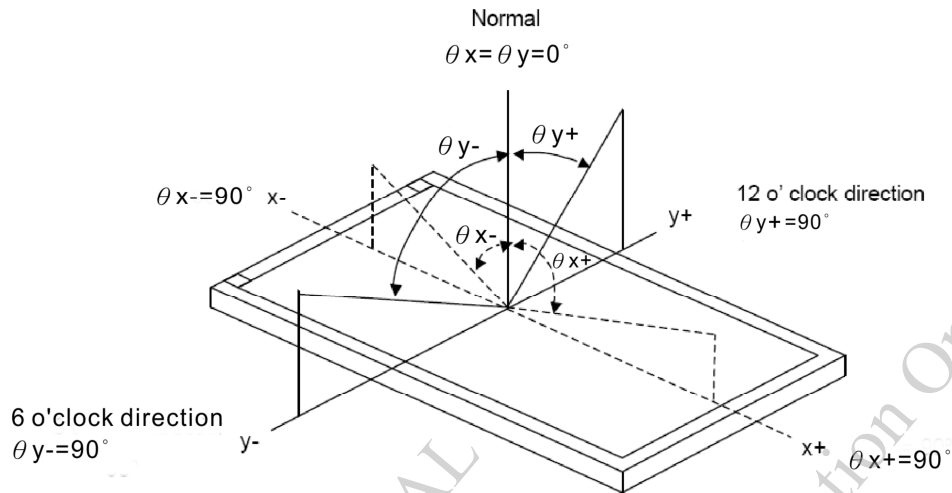
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK	
VIEWING ANGLE	θ_{y+}	CR ≥ 10	$\theta_x=0^\circ$	70	80	—	deg.	NOTE (2) NOTE (3)
	θ_{y-}			70	80	—		
	θ_{x+}		$\theta_y=0^\circ$	70	80	—		
	θ_{x-}			70	80	—		
CONTRAST RATIO (CENTER)	CR	$\theta_x=0^\circ, \theta_y=0^\circ$	600	800	—	—	NOTE (3)	
RESPONSE TIME	T_R (rise) + T_F (fall)	$\theta_x=0^\circ, \theta_y=0^\circ$	—	30	45	ms	NOTE (4)	
COLOR CHROMATICITY (CENTER)	WHITE	$\theta_x=0^\circ, \theta_y=0^\circ$ VDD-VSS=3.3V VCC-VSS=12V NTSC : 57 %	Wx	0.27	0.32	0.37	—	NOTE (5)
			Wy	0.31	0.36	0.41		
	RED		Rx	0.55	0.60	0.65		
			RY	0.30	0.35	0.40		
	GREEN		Gx	0.29	0.34	0.39		
			Gy	0.59	0.64	0.69		
	BLUE		Bx	0.09	0.14	0.19		
			By	0.02	0.07	0.12		
THE BRIGHTNESS OF MODULE (CENTER)	B		1000	1050	—	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 :



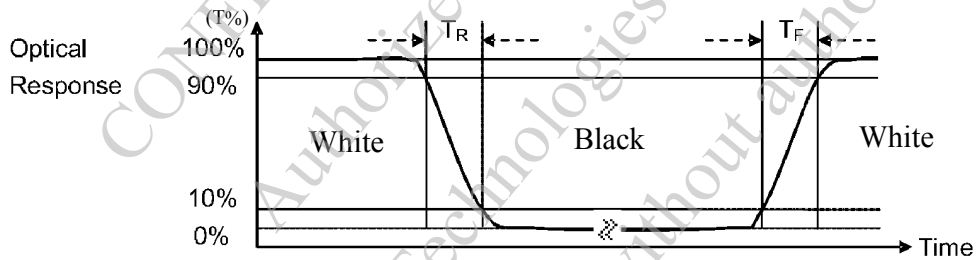
NOTE (3) : DEFINITION OF CONTRAST RATIO (CR) :

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.



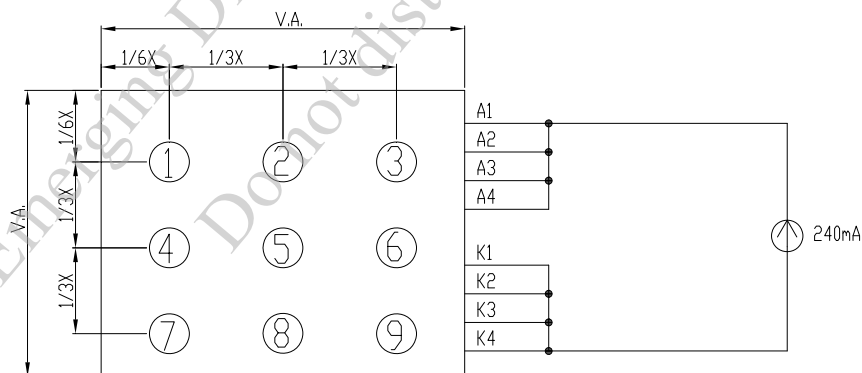
NOTE (5) : DEFINITION OF COLOR CHROMATICITY

(a) THE 100% TRANSMISSION IS DEFINED AS THE TRANSMISSION OF LCD PANEL WHEN ALL THE INPUT TERMINALS OF MODULE ARE ELECTRICALLY OPENED.

(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

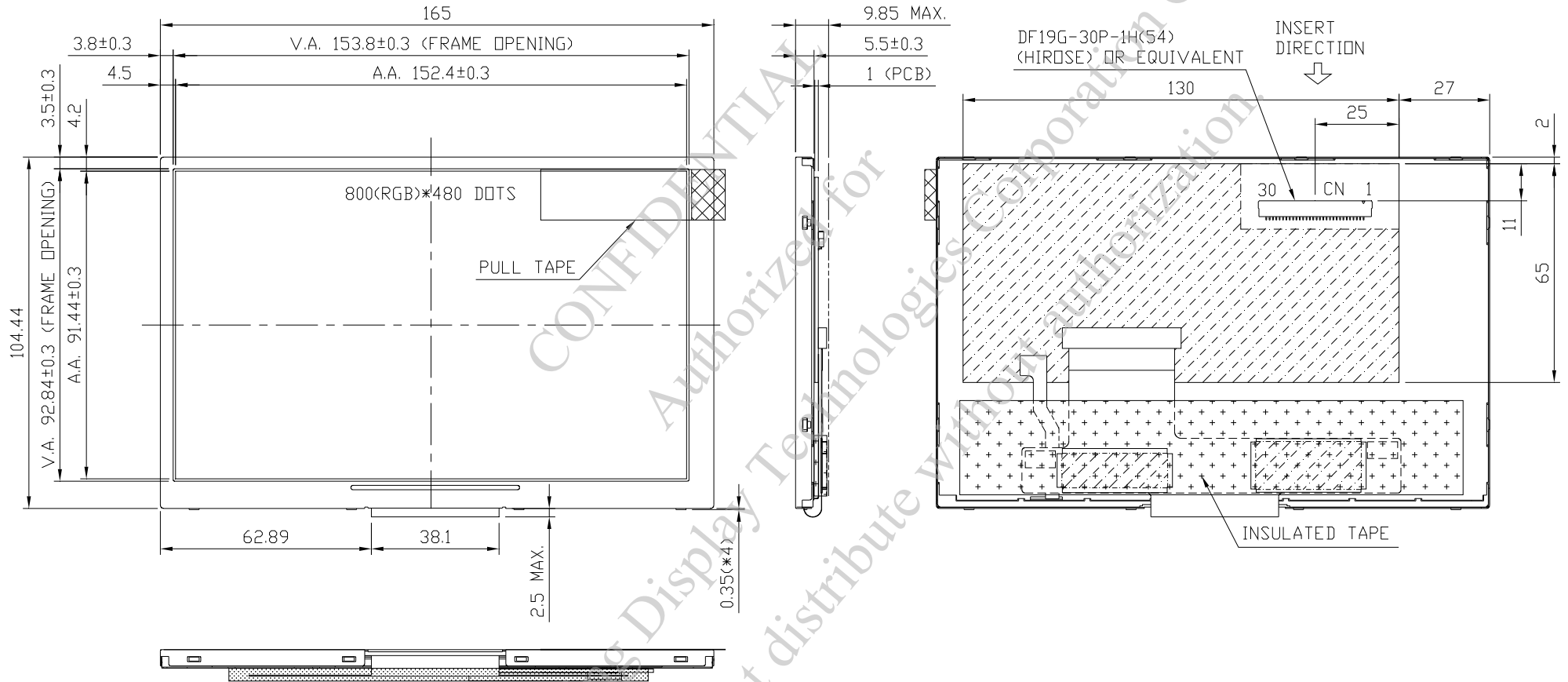


UNIT : mm

(b) THE BRIGHTNESS UNIFORMITY CALCULATING METHOD

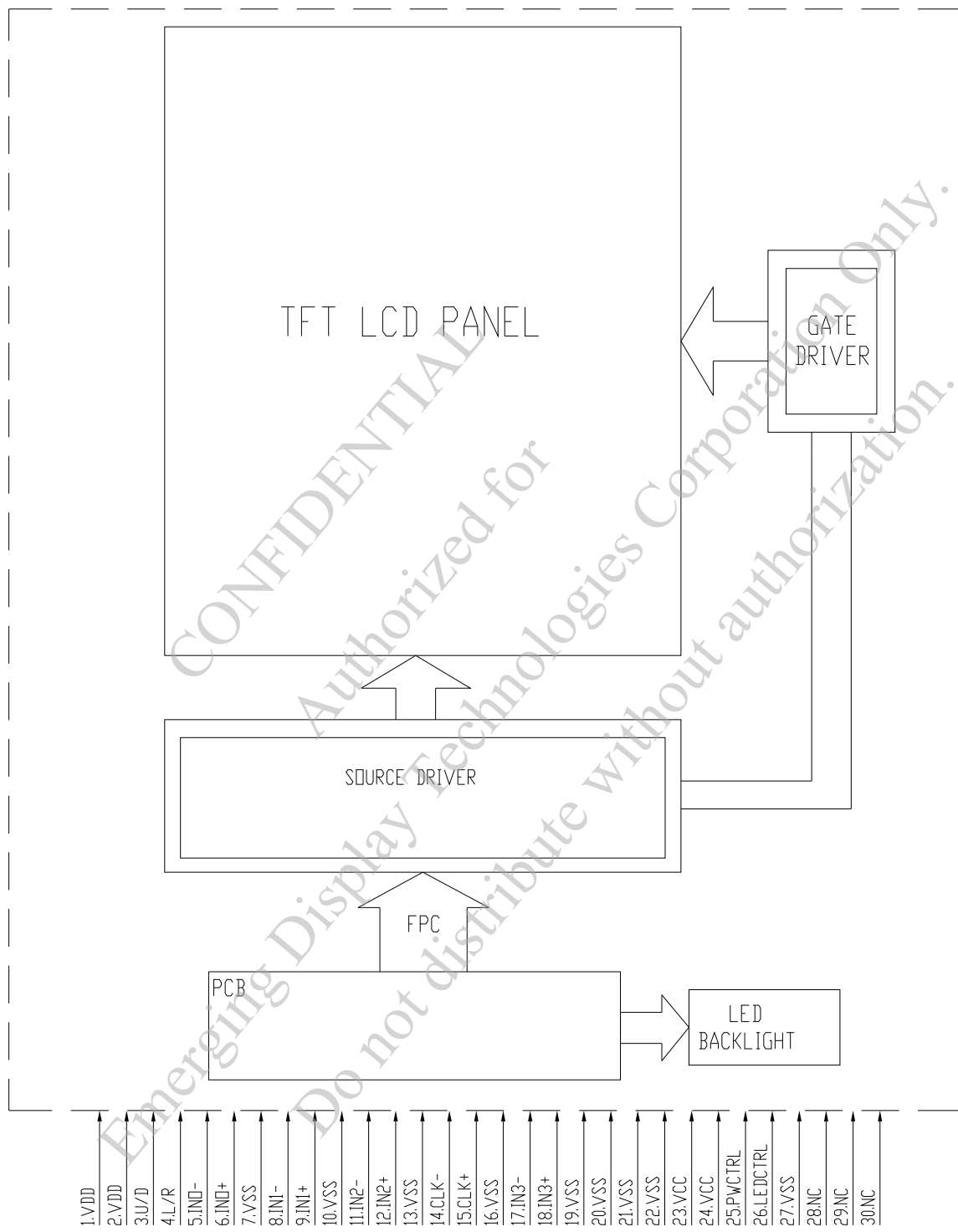
$$\text{UNIFORMITY} = \left[1 - \frac{\text{MAXIMUM BRIGHTNESS} - \text{MINIMUM BRIGHTNESS}}{\text{AVERAGE BRIGHTNESS}} \right] \times 100\%$$

7. OUTLINE DIMENSIONS

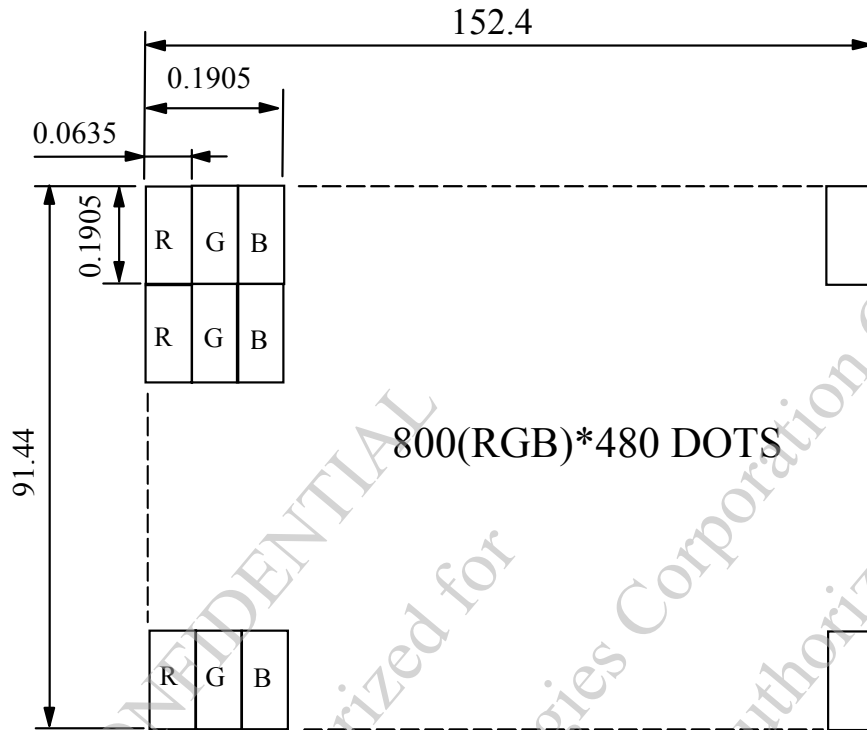


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

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

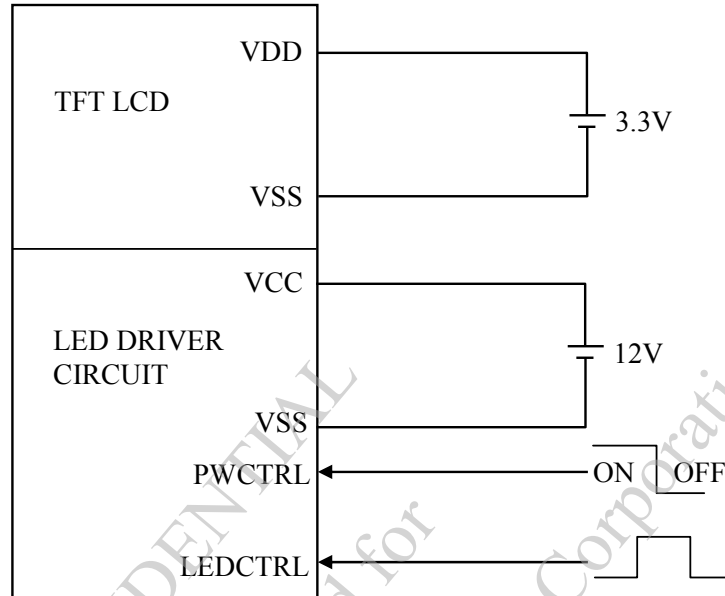
CONFIDENTIAL
Authorized for Emerging Display Technologies Corporation Only.
Do not distribute without authorization.

10. INTERFACE SIGNALS

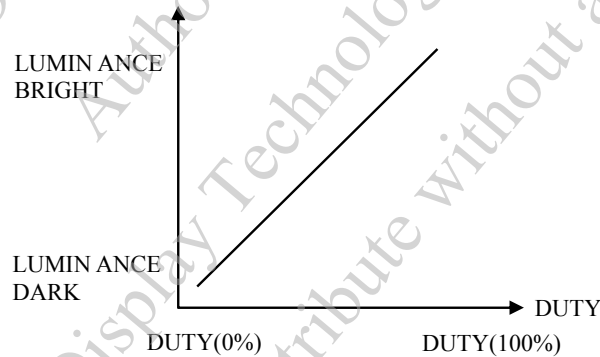
PIN NO.	SYMBOL	FUNCTION									
1	VDD	POWER SUPPLY VOLTAGE									
2	VDD	POWER SUPPLY VOLTAGE									
3	U/D	U/D=H:OUT1→OUT2→..... →OUT480 U/D=L: OUT480→..... → OUT2→OUT1									
4	L/R	L/R=H:OUT1→OUT2→..... →OUT800 L/R=L: OUT800→..... → OUT2→OUT1									
5	INO-	LVDS RECEIVER SIGNAL CHANNEL 0									
6	INO+	LVDS RECEIVER SIGNAL CHANNEL 0									
7	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
8	IN1-	LVDS RECEIVER SIGNAL CHANNEL 1									
9	IN1+	LVDS RECEIVER SIGNAL CHANNEL 1									
10	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
11	IN2-	LVDS RECEIVER SIGNAL CHANNEL 2									
12	IN2+	LVDS RECEIVER SIGNAL CHANNEL 2									
13	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
14	CLK-	LVDS RECEIVER SIGNAL CLOCK									
15	CLK+	LVDS RECEIVER SIGNAL CLOCK									
16	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
17	IN3-	LVDS RECEIVER SIGNAL CHANNEL 3									
18	IN3+	LVDS RECEIVER SIGNAL CHANNEL 3									
19	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
20	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
21	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
22	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
23	VCC	POWER SUPPLY FOR LED DRIVER CIRCUIT									
24	VCC	POWER SUPPLY FOR LED DRIVER CIRCUIT									
25	PWCTRL	<table border="1"> <thead> <tr> <th>LOGIC LEVEL</th> <th>PWCTRL</th> <th>REMARK</th> </tr> </thead> <tbody> <tr> <td>H=3.3V</td> <td>H</td> <td>POWER ON</td> </tr> <tr> <td>L=0V</td> <td>L</td> <td>SHUTDOWN</td> </tr> </tbody> </table>	LOGIC LEVEL	PWCTRL	REMARK	H=3.3V	H	POWER ON	L=0V	L	SHUTDOWN
		LOGIC LEVEL	PWCTRL	REMARK							
H=3.3V	H	POWER ON									
L=0V	L	SHUTDOWN									
26	LEDCTRL	BRIGHTNESS CONTROL FOR LED BACKLIGHT : POWER SUPPLY 0~3.3V OR PWM SIGNAL									
27	VSS	GROUND(VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)									
28	NC	NON CONNECTION									
29	NC	NON CONNECTION									
30	NC	NON CONNECTION									

11. POWER SUPPLY

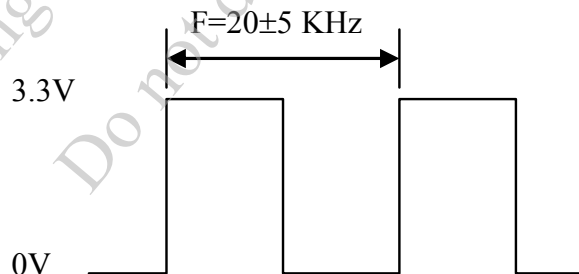
11.1 POWER SUPPLY FOR LCM



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



NOTE (2) : PWM SIGNAL=0~3.3V , OPERATION FREQUENCY : 20±5KHz



12. INSPECTION CRITERION

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±5cm

(2)VIEWING ANGLE : ±15°

±15° (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 15°

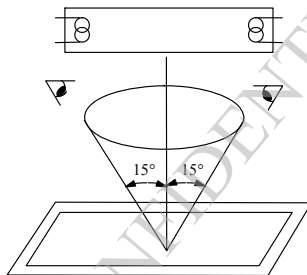


FIG.A

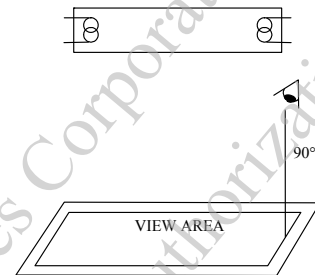


FIG.B

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 15° 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° WITH RESPECTS TO THE VERTICAL AXIS FROM EDGE OF VIEWING AREA.

12.2.2 ENVIRONMENT CONDITIONS :

AMBIENT TEMPERATURE		25±5°C
AMBIENT HUMIDITY		65±20%RH
AMBIENT ILLUMINATION	COSMETIC INSPECTION	600~800 Lux
	FUNCTIONAL INSPECTION	300~500 Lux
INSPECTION TIME		15 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

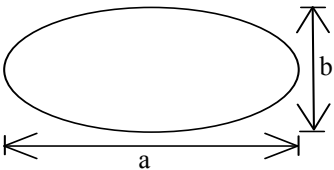
MINOR DEFECT : AQL 1.0


12.3 INSPECTION STANDARDS

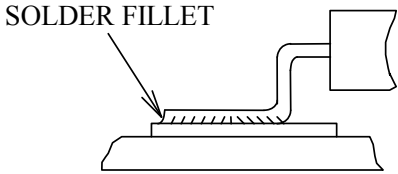
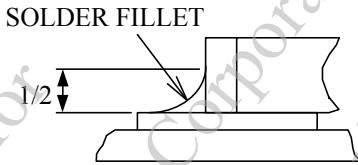
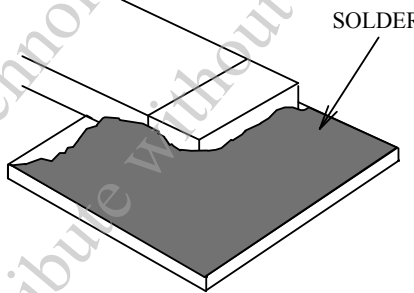
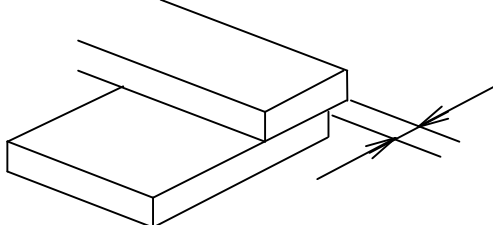
12.3.1 VISUAL DEFECTS CLASSIFICATION

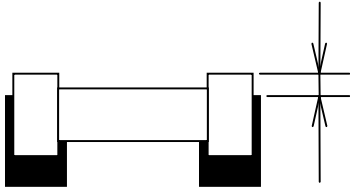
TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	<ul style="list-style-type: none"> • DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS EX: DISCONNECTION, SHORT CIRCUIT ETC 	0.65
	2.BACKLIGHT	<ul style="list-style-type: none"> • NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION 	
	3.DIMENSIONS	<ul style="list-style-type: none"> • SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS 	
MINOR DEFECT	1.DISPLAY ZONE	<ul style="list-style-type: none"> • BLACK/WHITE SPOT • BUBBLES ON POLARIZER • NEWTON RING • BLACK/WHITE LINE • SCRATCH • CONTAMINATION • UNEVEN COLOR SPREAD 	1.0
	2.BEZEL ZONE	<ul style="list-style-type: none"> • STAINS • SCRATCHES • FOREIGN MATTER 	
	3.SOLDERING	<ul style="list-style-type: none"> • INSUFFICIENT SOLDER • SOLDERED IN INCORRECT POSITION • CONVEX SOLDERING SPOT • SOLDER BALLS • SOLDER SCRAPS 	
	4.DISPLAY ON (ALL ON)	<ul style="list-style-type: none"> • 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	<p>(1)INSPECTION PATTERN: FULL WHITE, FULL BLACK, RED, GREEN AND BLUE SCREENS.</p> <p>(2)</p> <table border="1"> <thead> <tr> <th colspan="2">ITEM</th> <th>ACCEPTABLE COUNT</th> </tr> </thead> <tbody> <tr> <td rowspan="3">BRIGHT DOT</td> <td>RANDOM</td> <td>N = 3</td> </tr> <tr> <td>2 DOTS ADJACENT (PAIR)</td> <td>N = 0</td> </tr> <tr> <td>3 DOTS ADJACENT OR MORE</td> <td>N = 0</td> </tr> <tr> <td rowspan="3">DARK DOT</td> <td>RANDOM</td> <td>N ≤ 5</td> </tr> <tr> <td>2 DOTS ADJACENT (PAIR)</td> <td>N = 0</td> </tr> <tr> <td>3 DOTS ADJACENT OR MORE</td> <td>N = 0</td> </tr> <tr> <td colspan="2">TOTAL BRIGHT AND DARK DOT</td> <td>N ≤ 5</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. THE BRIGHT DOT DEFECT MOST BE VISIBLE THROUGH A 5% ND FILTER</p> <p>2. BRIGHT DOT : DOTS APPEAR BRIGHT AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER BLACK PATTERN.</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>	ITEM		ACCEPTABLE COUNT	BRIGHT DOT	RANDOM	N = 3	2 DOTS ADJACENT (PAIR)	N = 0	3 DOTS ADJACENT OR MORE	N = 0	DARK DOT	RANDOM	N ≤ 5	2 DOTS ADJACENT (PAIR)	N = 0	3 DOTS ADJACENT OR MORE	N = 0	TOTAL BRIGHT AND DARK DOT		N ≤ 5
ITEM		ACCEPTABLE COUNT																				
BRIGHT DOT	RANDOM	N = 3																				
	2 DOTS ADJACENT (PAIR)	N = 0																				
	3 DOTS ADJACENT OR MORE	N = 0																				
DARK DOT	RANDOM	N ≤ 5																				
	2 DOTS ADJACENT (PAIR)	N = 0																				
	3 DOTS ADJACENT OR MORE	N = 0																				
TOTAL BRIGHT AND DARK DOT		N ≤ 5																				
4	FOREIGN BLACK/WHITE/ BRIGHT LINE/ 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>$W \leq 0.05$</td> <td>IGNORE</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.05 < W \leq 0.1$</td> <td>4</td> </tr> <tr> <td>$5.0 < L$</td> <td>$0.1 < W$</td> <td>NONE</td> </tr> </tbody> </table> <p>WIDTH : W mm, LENGTH : L mm</p>	LENGTH : L	WIDTH : W	PERMISSIBLE NO.	—	$W \leq 0.05$	IGNORE	$L \leq 5.0$	$0.05 < W \leq 0.1$	4	$5.0 < L$	$0.1 < W$	NONE								
LENGTH : L	WIDTH : W	PERMISSIBLE NO.																				
—	$W \leq 0.05$	IGNORE																				
$L \leq 5.0$	$0.05 < W \leq 0.1$	4																				
$5.0 < L$	$0.1 < W$	NONE																				
5	POLARIZER SCRATCHES	<table border="1"> <thead> <tr> <th>LENGTH : L</th> <th>WIDTH : W</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>—</td> <td>$W \leq 0.05$</td> <td>IGNORE</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.05 < W \leq 0.1$</td> <td>4</td> </tr> <tr> <td>$5.0 < L$</td> <td>$0.1 < W$</td> <td>NONE</td> </tr> </tbody> </table> <p>WIDTH : W mm, LENGTH : L mm</p>	LENGTH : L	WIDTH : W	PERMISSIBLE NO.	—	$W \leq 0.05$	IGNORE	$L \leq 5.0$	$0.05 < W \leq 0.1$	4	$5.0 < L$	$0.1 < W$	NONE								
LENGTH : L	WIDTH : W	PERMISSIBLE NO.																				
—	$W \leq 0.05$	IGNORE																				
$L \leq 5.0$	$0.05 < W \leq 0.1$	4																				
$5.0 < L$	$0.1 < W$	NONE																				
6	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>$D \leq 0.15$</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> </tbody> </table> <p>NOTE : DIAMETER $D=(a+b)/2$</p> 	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		
		AVERAGE DIAMETER (mm) : D	NUMBER OF PIECES PERMITTED	
7	BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS	BUBBLE ON THE POLARIZER	D ≤ 0.15	IGNORE
			0.15 < D ≤ 0.5	N ≤ 4
			0.5 < D	NONE
		SURFACE STAINS	D ≤ 0.1	IGNORE
			0.1 < D ≤ 0.5	N ≤ 4
		CF FAIL / SPOT	D ≤ 0.1	IGNORE
		0.1 < D ≤ 0.5	N ≤ 4	
		<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> 		
8	LINE DEFECT ON DISPLAY	OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOWED		
9	MURA ON DISPLAY	NOT VISIBLE THROUGH 5% ND FILTER OR JUDGED BY LIMIT SAMPLE IF NECESSARY.		
10	UNEVEN COLOR SPREAD, COLORATION	(1)TO BE DETERMINED BASED UPON THE STANDARD SAMPLE.		
11	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.		
12	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
13	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
13	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. (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.</p>
14	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>
15	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>

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 +85°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 +85°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)	<p>THE SAMPLE SHOULD BE ALLOWED TO STAND THE FOLLOWING 10 CYCLES OF OPERATION :</p>
7	ESD (ELECTROSTATIC DISCHARGE) (NOT OPERATED)	HUMAN BODY MODEL C=100pF, R=1.5KΩ; DISCHARGE: ±2KV

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 FUNCTIONING 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 40%. IF THE MODULE IS OPERATED AT A HIGHER DUTY CYCLE THAN 40%, THEN THERE IS A POSSIBILITY OF DISTORTION AND IRREGULARITY OF THE PICTURE DUE TO LIQUID CRYSTAL BEHAVIOR.

13.2 TESTING CONDITIONS AND INSPECTION CRITERIA

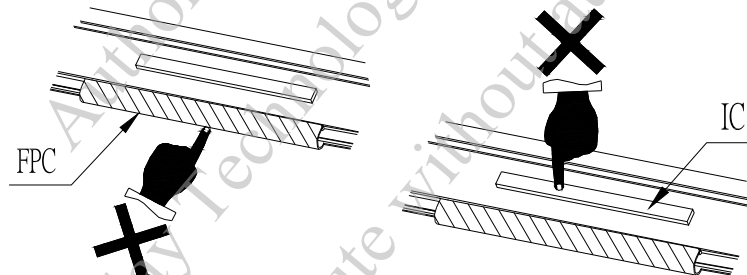
FOR THE FINAL TEST THE TESTING SAMPLE MUST BE STORED AT ROOM TEMPERATURE FOR 24 HOURS, AFTER THE TESTS LISTED IN TABLE 13.1, STANDARD SPECIFICATIONS FOR RELIABILITY HAVE BEEN EXECUTED IN ORDER TO ENSURE STABILITY.

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 HANDLING

- 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.