EXAMINED BY : Vincent Wu	EMERGING DISPLAY	FILE NO . CAS-0006787
		ISSUE : MAR.11, 2010
APPROVED BY: David Chang	TECHNOLOGIES CORPORATION	TOTAL PAGE : 24
		VERSION : 7

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

ET0350G0DM6
(RoHS)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

RECORDS OF REVISION

DOC . FIRST ISSUE

JAN.06, 2009

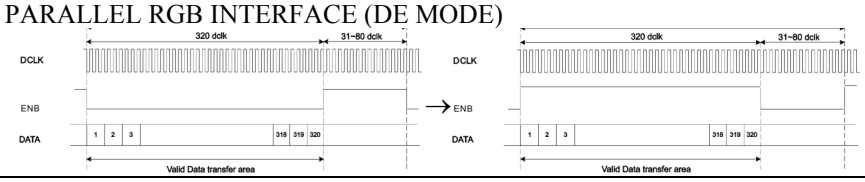
DATE	REVISED PAGE NO.	SUMMARY
JAN.21, 2009	9	7. OUTLINE DIMENSIONS MARK △1 : MODIFY COMPONENT AREA & CONNECTOR DIMENSION
FEB.16, 2009	6	5.4 PARALLEL RGB INTERFACE (DE MODE) 
	14	ADD 11.2 THE BRIGHTNESS CONTROLLED BY BACKLIGHT CURRENT OF LEDCTRL.
MAR.09, 2009	3	4. ELECTRICAL CHARACTERISTICS POWER SUPPLY CURRENT FOR LED DRIVER : TYP=(30) → (220), MAX.= (50) → (290)
	9	7. OUTLINE DIMENSIONS MARK △2 : CHANGE CONNECTOR & MODIFY DIMENSION & ADD PULL TAPE
	10	8. BLOCK DIMENSIONS ADD FRAME GROUND
APR.07, 2009	9	7. OUTLINE DIMENSIONS MARK △3 : MODIFY CN1 TYPE
SEP.02,2009	3	4 . ELECTRICAL CHARACTERISTICS PARAMETER | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT | REMARK POWER SUPPLY CURRENT FOR LED DRIVER | ICC | VCC-VSS=3.3V LED B/L=ON | — | (220) | (290) | mA | ↓ PARAMETER | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT | REMARK POWER SUPPLY CURRENT FOR LED DRIVER | ICC | VCC-VSS=3.3V LED B/L=ON | — | 220 | 290 | mA |
MAR.11, 2010	12	10. INTERFACE SIGNALS PIN NO.26 ~28 : ENB FLOATING → ENB CONNECTED TO GROUND

TABLE OF CONTENTS

1. GENERAL SPECIFICATIONS

1.1 APPLICATION NOTES FOR CONTROLLER/DRIVER
PLEASE REFER TO :

HX8238-A

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)

2. MECHANICAL SPECIFICATIONS

(1) DIAGONALS	----------	3.5 inch
(2) NUMBER OF DOTS	----------	320W * (RGB) * 240H DOTS
(3) MODULE SIZE	----------	76.8W * 63.8H * 7.5D(MAX) mm (WITHOUT FPC)
(4) ACTIVE AREA	----------	70.08W * 52.56H mm
(5) DOT SIZE	----------	0.073W * 0.219H mm
(6) PIXEL SIZE	----------	0.219W * 0.219H mm
(7) LCD TYPE	----------	TFT , TRANSMISSIVE
(8) COLOR	----------	262K
(9) VIEWING DIRECTION	----------	6 O'CLOCK
(10) BACK LIGHT	----------	LED , COLOR : WHITE
(11) INTERFACE MODE	----------	RGB 18BIT PARALLEL (DE/SYNC MODE)

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD–VSS	VSS-0.3	4.0	V	—
STATIC ELECTRICITY	—	—	—	V	NOTE (1)
LED BACKLIGHT POWER DISSIPATION	PD	—	540	mW	—
LED BACKLIGHT FORWARD CURRENT	IF	—	25	mA	—
LED BACKLIGHT REVERSE VOLTAGE	VR	—	30	V	—

NOTE (1)：LCD SHOULD BE GROUNDED DURING HANDING LCM.

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

I T E M	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20°C	70°C	-30°C	80°C	NOTE (1), (2)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	—	2.45m/s^2 (0.25G)	—	11.76m/s^2 (1.2G)	5~20Hz , 1HR 20~500Hz(20Hz) , 1HR 20~500Hz(500Hz) , 1HR X,Y,Z,TOTAL 3HRS
SHOCK	—	29.4m/s^2 (3G)	—	490m/s^2 (50G)	10 m SECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (1) : Ta AT -30°C : 48HRS MAX .
80°C : 168HRS MAX .

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

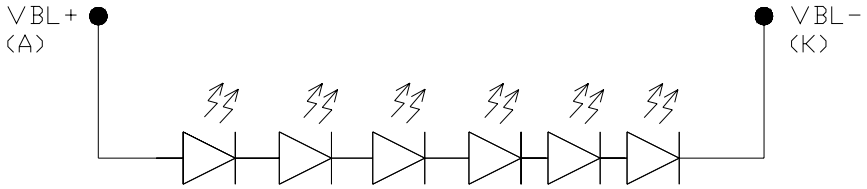
NOTE (3) : Ta ≤ 60°C : 90%RH MAX (96HRS MAX).
Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 60°C(96HRS MAX).

4. ELECTRICAL CHARACTERISTICS

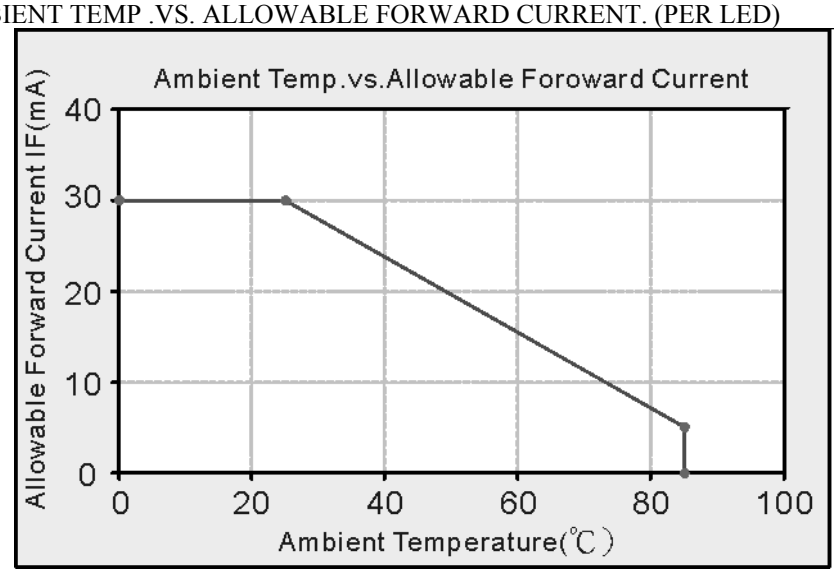
Ta = 25 °C

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD–VSS	—	2.5	3.3	3.6	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VCC–VSS	—	2.7	3.3	3.6	V	
LOGIC HIGH INPUT VOLTAGE	VIH	H LEVEL	0.8*VDD	—	VDD	V	NOTE (1)
LOGIC LOW INPUT VOLTAGE	VIL	L LEVEL	0	—	0.2*VDD	V	
POWER SUPPLY CURRENT	IDD	VDD–VSS=3.3V	—	10	15	mA	NOTE (2)
POWER SUPPLY CURRENT FOR LED DRIVER	ICC	VCC–VSS=3.3V LED B/L=ON	—	220	290	mA	
POWER SUPPLY FOR LED BACKLIGHT	V_{BL+}–V_{BL-}	IF=20mA	18	19.8	21.6	V	NOTE (3)
LED LIFE TIME	—	—	30K	40K	—	HRS	

NOTE (1) : APPLIED TO TERMINALS /RESET, B5~B0, G5~G0, R5~R0, DCLK, HSYNC, VSYNC, ENB.
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)

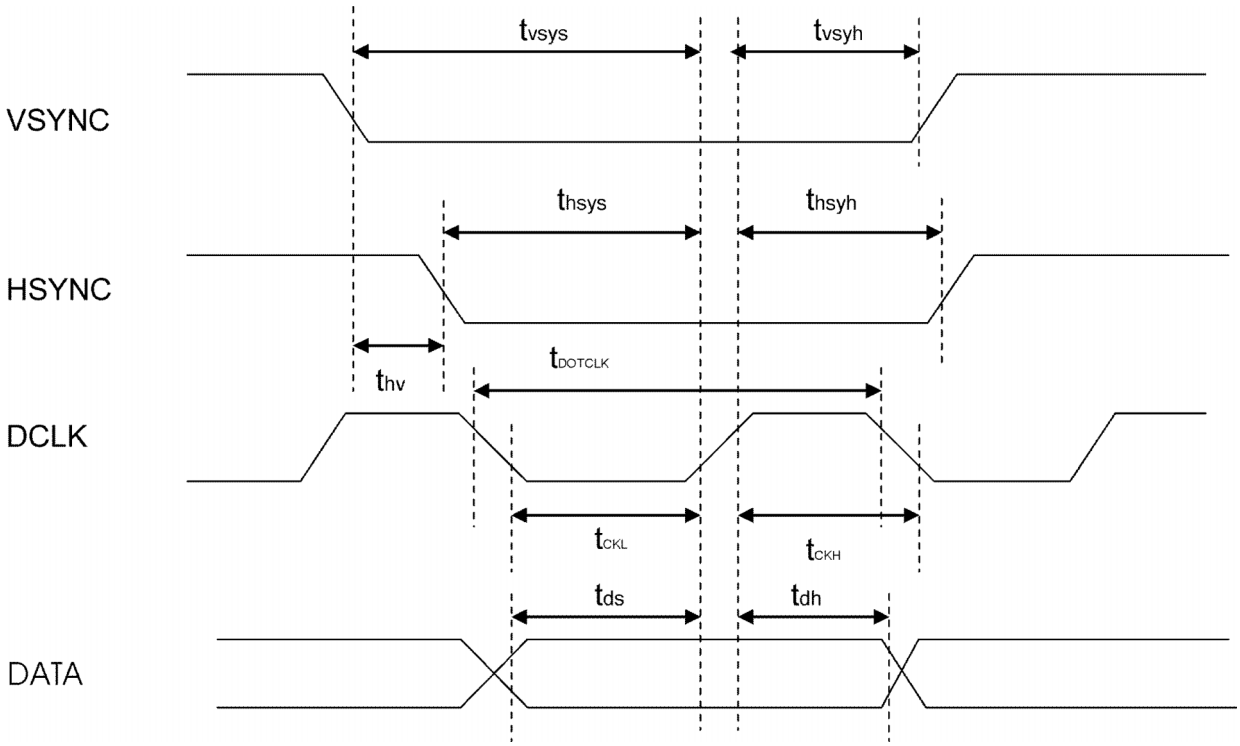


5 . TIMING CHARACTERISTICS

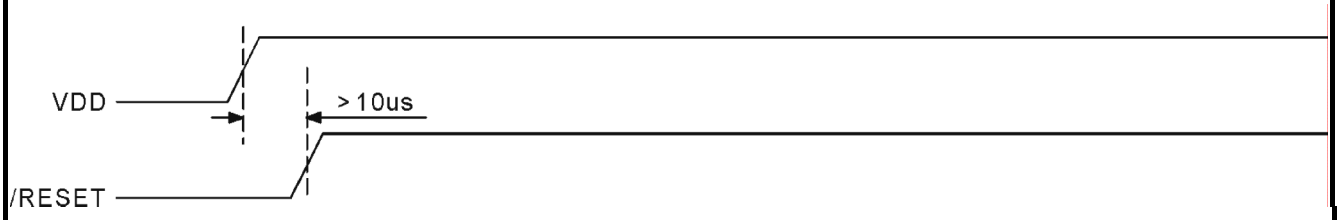
5.1 PIXEL TIMING

Ta=25 °C

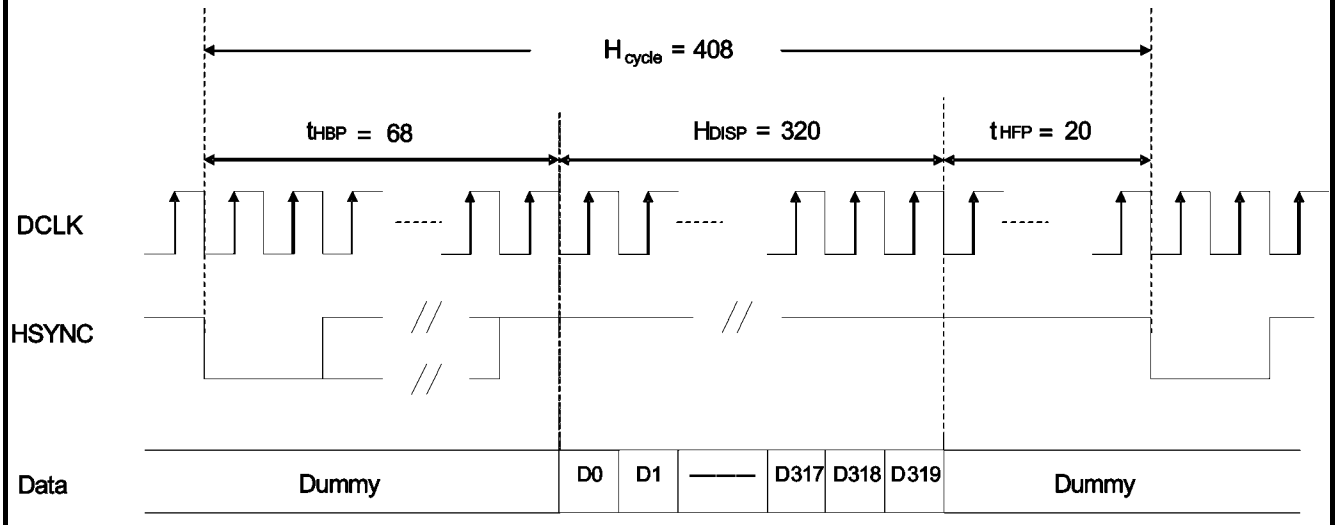
CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
DCLK FREQUENCY	fDCLK	—	6.5	10	MHz
DCLK PERIOD	tDCLK	100	154	—	ns
VERTICAL SYNC SETUP TIME	tvsys	20	—	—	ns
VERTICAL SYNC HOLD TIME	tvsyh	20	—	—	ns
HORIZONTAL SYNC SETUP TIME	thsys	20	—	—	ns
HORIZONTAL SYNC HOLD TIME	tvsyh	20	—	—	ns
PHASE DIFFERENCE OF SYNC SIGNAL FALLING EDGE	thv	1	—	240	tDCLK
DOTCLK LOW PERIOD	tCKL	50	—	—	ns
DOTCLK HIGH PERIOD	tCKH	50	—	—	ns
DATA SETUP TIME	tds	12	—	—	ns
DATA HOLD TIME	tdh	12	—	—	ns
RESET PULSE WIDTH	tRES	10	—	—	µs



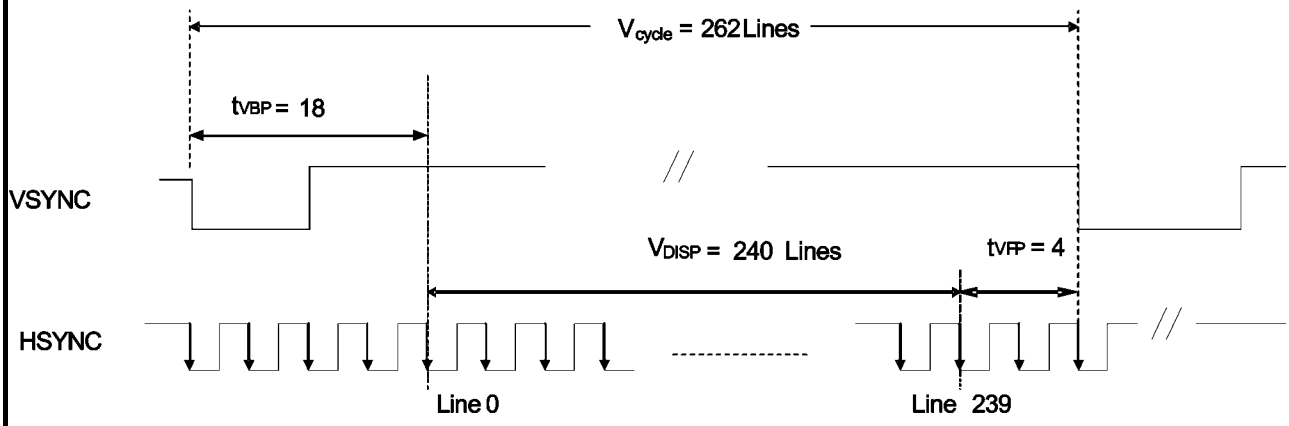
5.2 RESET TIMING



5.3 PARALLEL RGB INTERFACE (SYNC MODE)

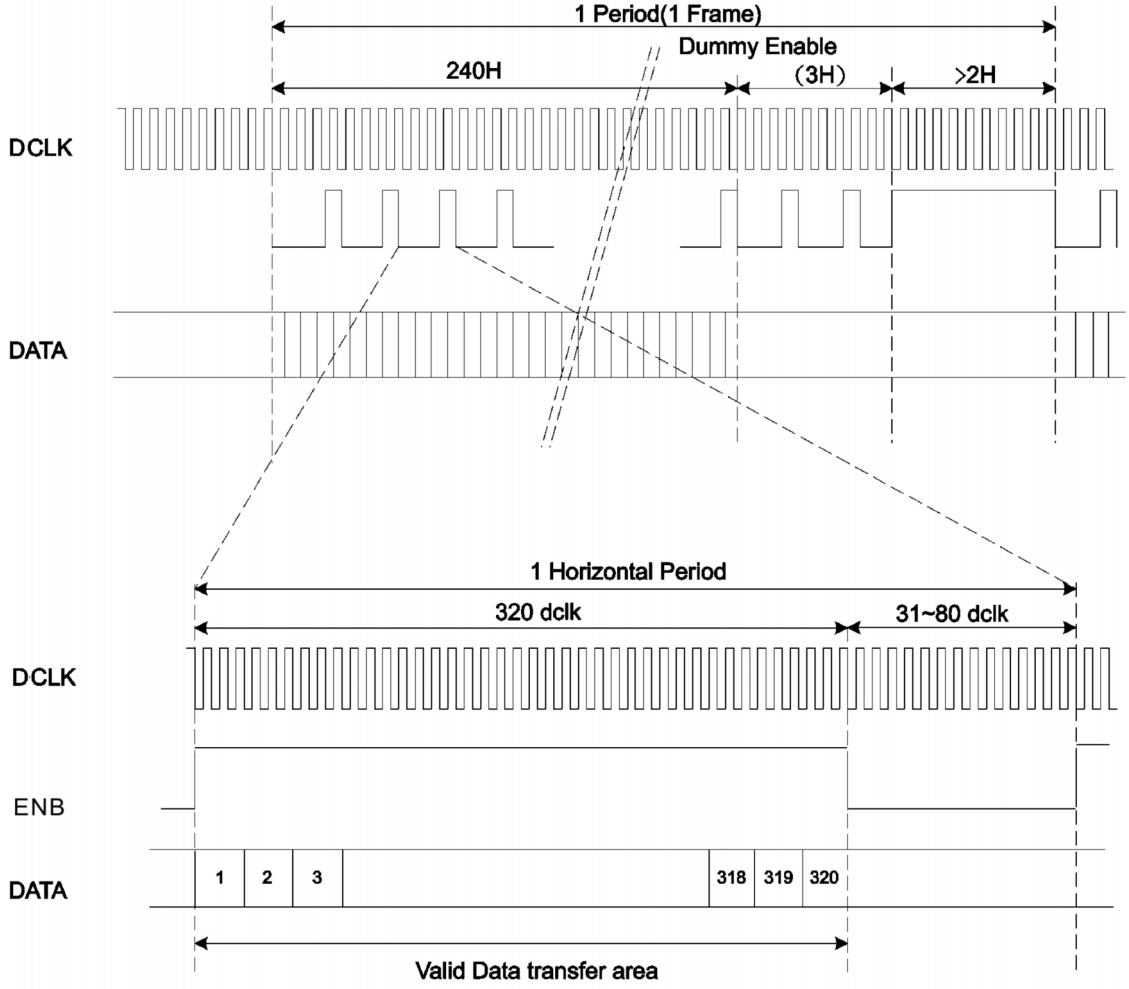


a) Horizontal Data Transaction Timing



b) Vertical Data Transaction Timing

5.4 PARALLEL RGB INTERFACE (DE MODE)



CHARACTERISTICS		SYMBOL	MIN.	TYP.	MAX.	
DCLK FREQUENCY		fDCLK	—	6.5	10	MHz
DCLK PERIOD		tDCLK	100	154	—	ns
HORIZONTAL FREQUENCY (LINE)		fH	—	15.72	22.35	KHz
VERTICAL FREQUENCY (REFRESH)		fV	—	60	90	Hz
HORIZONTAL BACK PORCH		tHBP	—	68	—	tDCLK
HORIZONTAL FRONT PORCH		tHFP	—	20	—	tDCLK
HORIZONTAL DATA START POINT		tHBP	—	68	—	tDCLK
HORIZONTAL BLANKING PERIOD		tHBP + tHFP	—	88	—	tDCLK
HORIZONTAL DISPLAY AREA		HDISP	—	320	—	tDCLK
HORIZONTAL CYCLE		Hcycle	—	408	450	tDCLK
VERTICAL BACK PORCH		tVBP	—	18	—	Lines
VERTICAL FRONT PORCH		tVFP	—	4	—	Lines
VERTICAL DATA START POINT		tVBP	—	18	—	Lines
VERTICAL BLANKING PERIOD		tVBP + tVFP	—	22	—	Lines
VERTICAL DISPLAY AREA	NTSC	VDISP	—	240	—	Lines
	PAL		—	280(PALM=0)	—	
			—	280(PALM=1)	—	
VERTICAL CYCLE	NTSC	Vcycle	—	262	350	Lines
	PAL		—	313		

6 . OPTICAL CHARACTERISTICS (NOTE1)

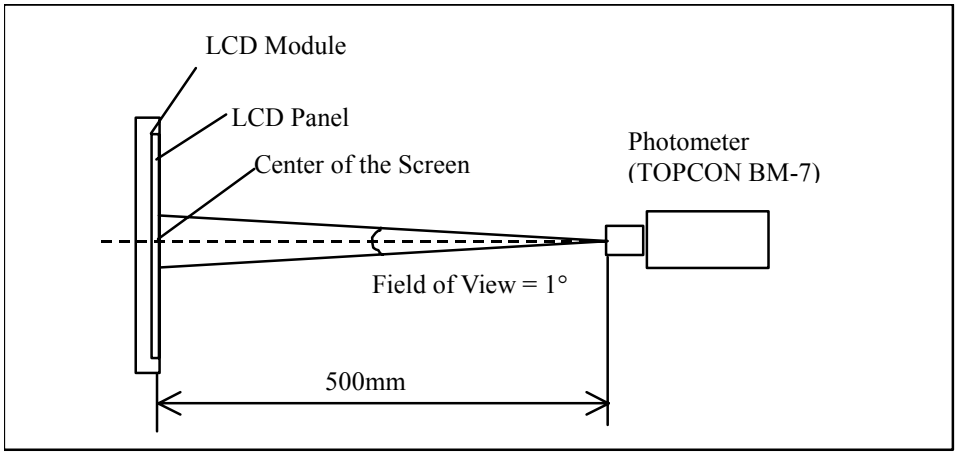
6.1 OPTICAL CHARACTERISTICS

Ta = 2 5 ± 2°C

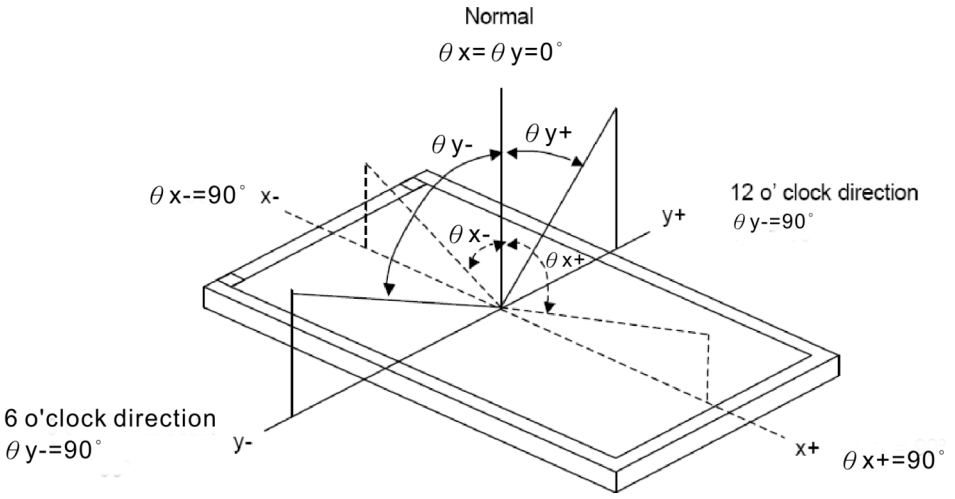
I T E M		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	REMARK
VIEWING ANGLE		θ_{y+}	CR ≥ 10	θ_x=0°	50	55	—	deg.	NOTE(2) NOTE(3)
		θ_{y-}			70	75	—		
		θ_{x+}		θ_y=0°	70	75	—		
		θ_{x-}			70	75	—		
CONTRAST RATIO		CR	θx=0° , θy=0°		350	450	—	—	NOTE (3)
RESPONSE TIME		T_R(rise)	θx=0° , θy=0°		—	15	20	msec	NOTE (4)
		T_F(fall)			—	35	50		
COLOR OF CIE COORDINATE	WHITE	Wx	θx=0° , θy=0° IF=20mA NTSC：60%		0.260	0.310	0.360	—	NOTE(5)
		Wy			0.260	0.310	0.360		
	RED	Rx			0.562	0.612	0.662	—	
		Ry			0.305	0.355	0.405		
	GREEN	Gx			0.262	0.312	0.362	—	
		Gy			0.533	0.583	0.633		
	BLUE	Bx			0.090	0.140	0.190	—	
		By			0.020	0.070	0.120		
THE BRIGHTNESS OF MODULE		B	θx=0° , θy=0° IF=20mA		350	400	—	cd/m^2	NOTE (6)
THE UNIFORMITY OF MODULE		—	θx=0° , θy=0° IF=20mA		70	—	—	%	NOTE(6)

NOTE (1) : TEST EQUIPMENT SETUP :

AFTER STABILIZING AND LEAVING THE PANEL ALONE AT A GIVEN TEMPERATURE FOR 30 MINUTES, THE MEASUREMENT SHOULD BE EXECUTED. MEASUREMENT SHOULD BE EXECUTED IN A STABLE, WINDLESS, AND DARK ROOM. OPTICAL SPECIFICATIONS ARE MEASURED BY TOPCON BM-7 (FAST) WITH A VIEWING ANGLE OF 1° AT A DISTANCE OF 50cm AND NORMAL DIRECTION.



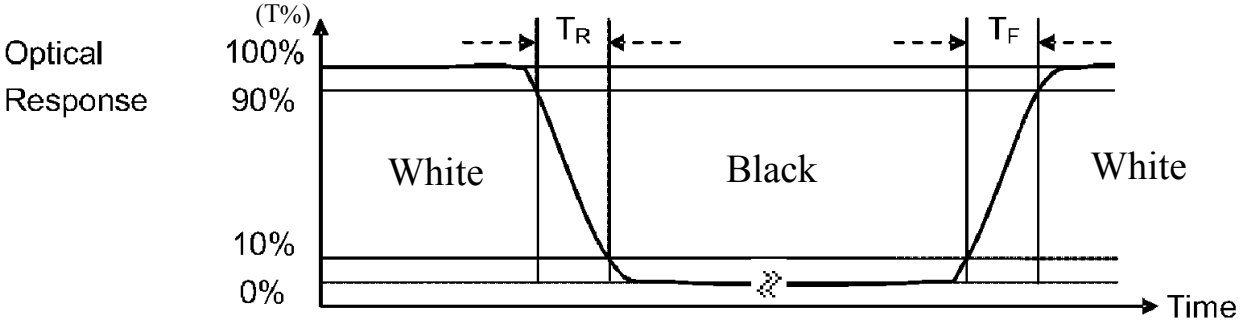
NOTE (2) : DEFINITION OF VIEWING ANGLE :



NOTE (3) : DEFINITION OF CONTRAST RATIO :

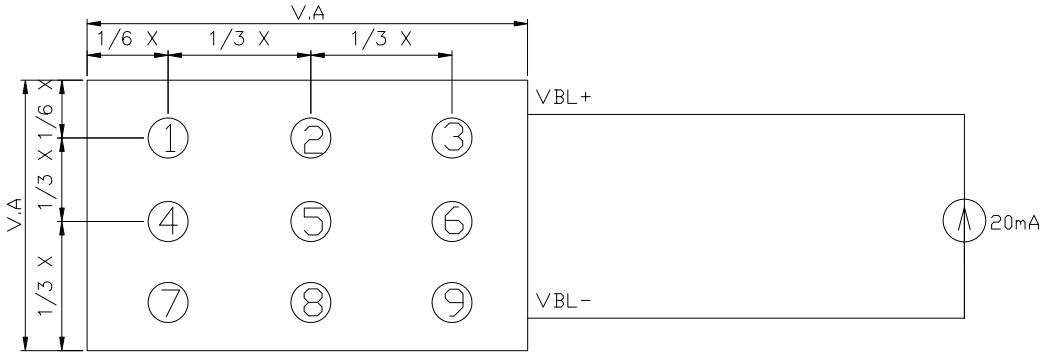
$$\text{CONTRAST RATIO(CR)} = \frac{\text{BRIGHTNESS MEASURED WHEN LCD IS AT "WHITE STATE"}}{\text{BRIGHTNESS MEASURED WHEN LCD IS AT "BLACK STATE"}}$$

NOTE (4) : DEFINITION OF RESPONSE TIME : TR AND TF
THE FIGURE BELOW IS THE OUTPUT SIGNAL OF THE PHOTO DETECTOR.



NOTE (5) : THE 100% TRANSMISSION IS DEFINED AS THE TRANSMISSION OF LCD PANEL WHEN ALL THE INPUT TERMINALS OF MODULE ARE ELECTRICALLY OPENED.
NOTE (6) : BRIGHTNESS MEASURED WHEN LCD IS AT “WHITE STATE”

6.2 THE TEST METHOD OF BRIGHTNESS AND UNIFORMITY

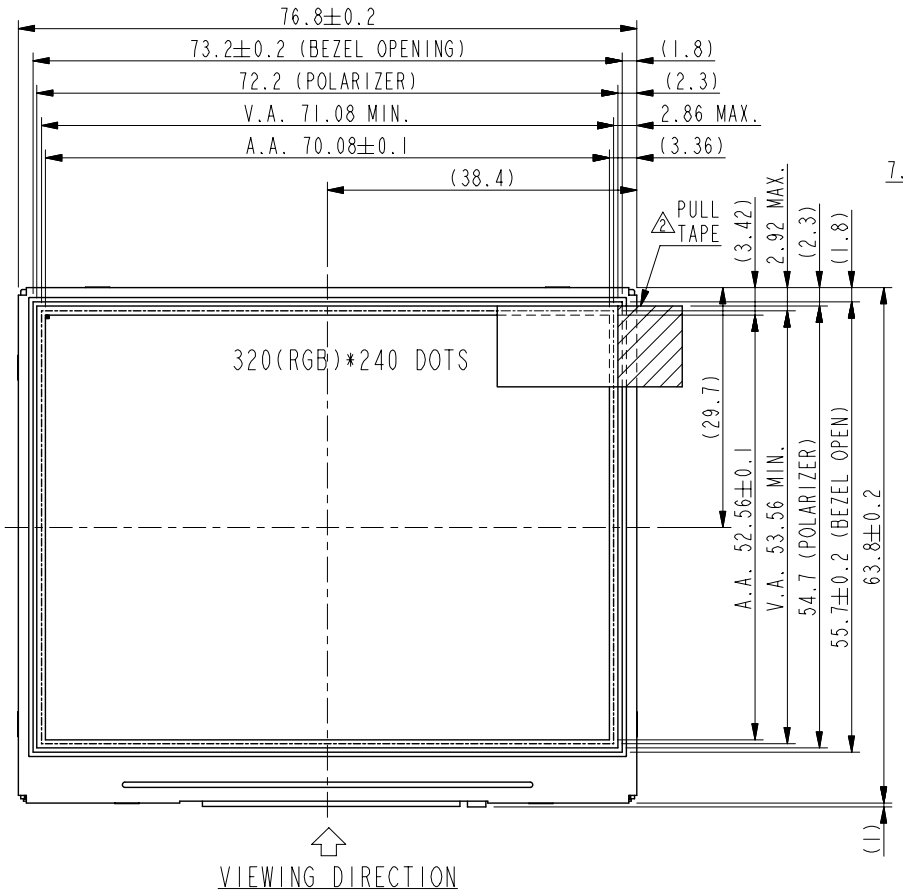


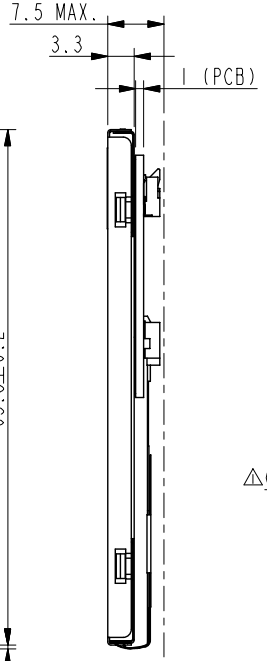
UNIT：mm

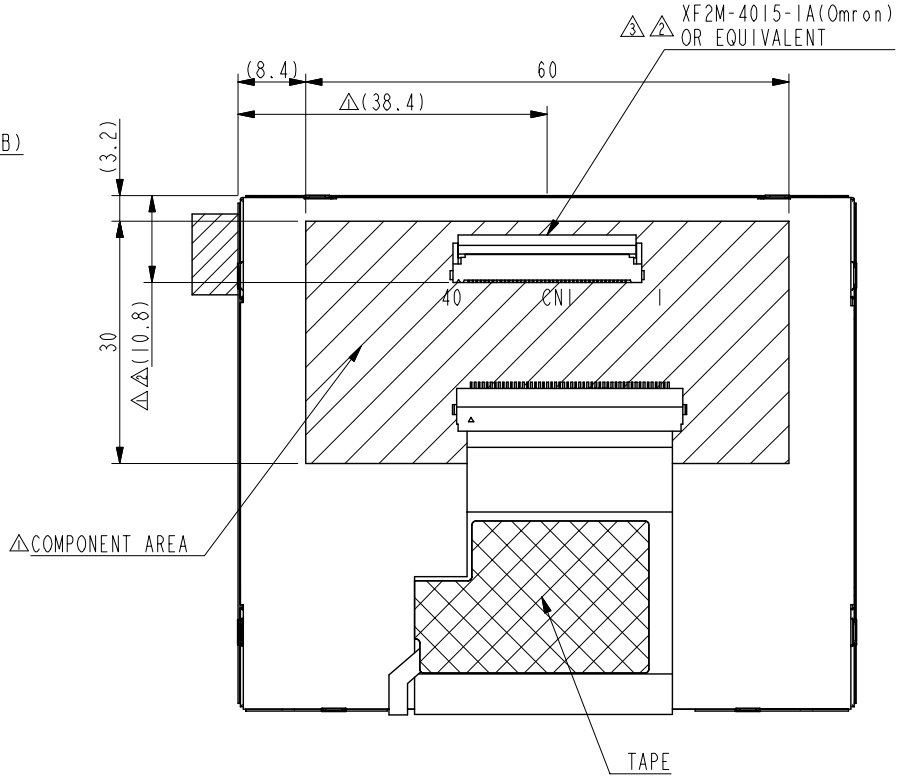
6.3 THE CALCULATING METHOD OF UNIFORMITY

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

7. OUTLINE DIMENSIONS

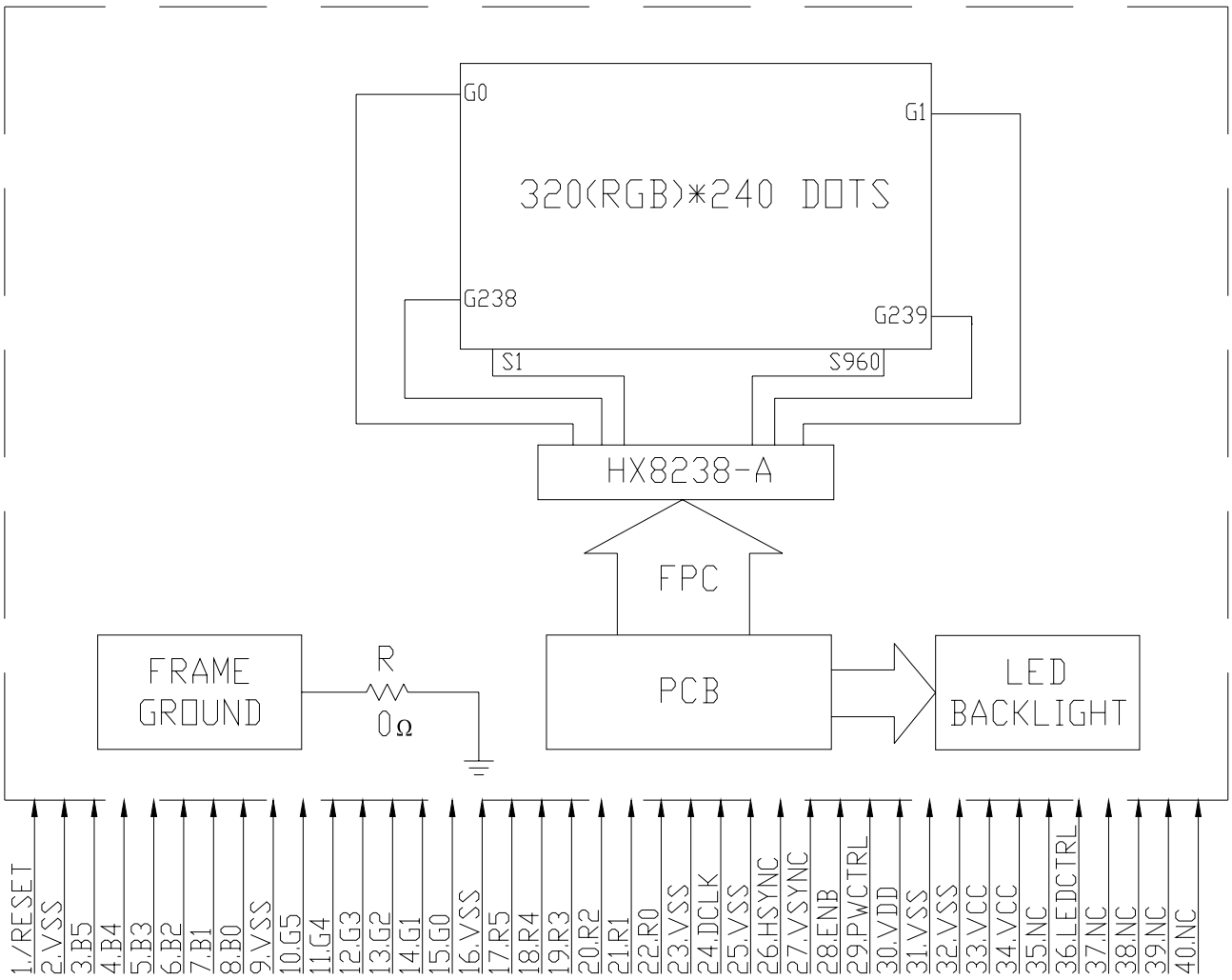




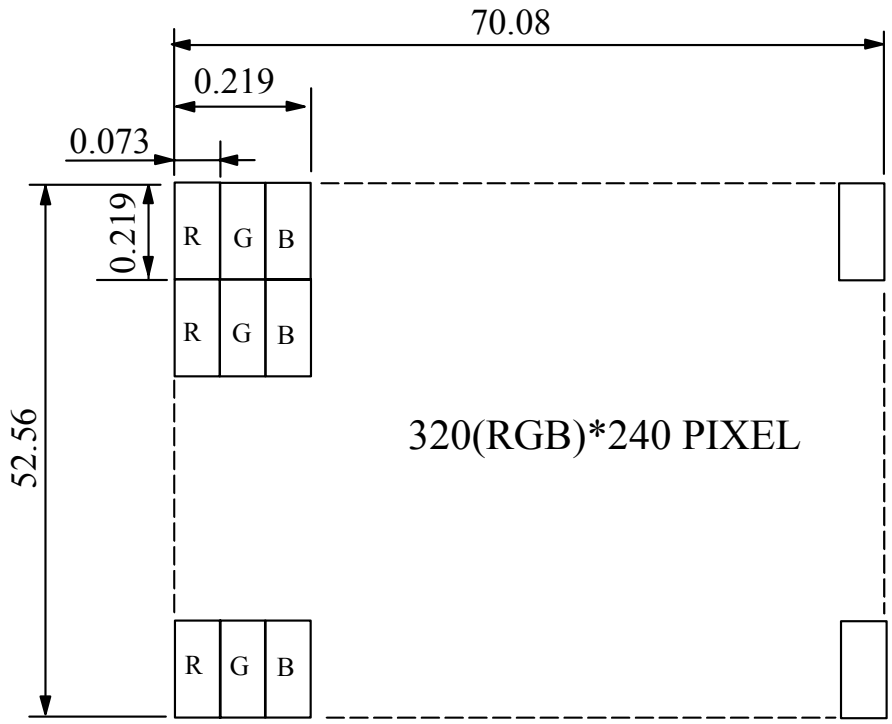


UNIT : mm
SCALE : NTS
NOT SPECIFIED LENGTH TOLERANCE IS ± 0.5
NOTE : MARK △3 MODIFY (NUMBER NOTE MODIFY VERSION)

8 . BLOCK DIMENSIONS



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	I/O	FUNCTION
1	/RESET	I	HARDWARE RESET
2	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
3	B5	I	BLUE DATA BIT 5
4	B4	I	BLUE DATA BIT 4
5	B3	I	BLUE DATA BIT 3
6	B2	I	BLUE DATA BIT 2
7	B1	I	BLUE DATA BIT 1
8	B0	I	BLUE DATA BIT 0
9	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
10	G5	I	GREEN DATA BIT 5
11	G4	I	GREEN DATA BIT 4
12	G3	I	GREEN DATA BIT 3
13	G2	I	GREEN DATA BIT 2
14	G1	I	GREEN DATA BIT 1
15	G0	I	GREEN DATA BIT 0
16	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
17	R5	I	RED DATA BIT 5
18	R4	I	RED DATA BIT 4
19	R3	I	RED DATA BIT 3
20	R2	I	RED DATA BIT 2
21	R1	I	RED DATA BIT 1
22	R0	I	RED DATA BIT 0
23	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
24	DCLK	I	DOT DATA CLOCK
25	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
26	HSYNC	I	HORIZONTAL SYNC INPUT
27	VSYNC	I	VERTICAL SYNC INPUT
28	ENB	I	DATA ENABLE INPUT

DE MODE：HSYNC, VSYNC FLOATING
SYNC MODE：ENB CONNECTED TO GROUND

29	PWCTRL	I	

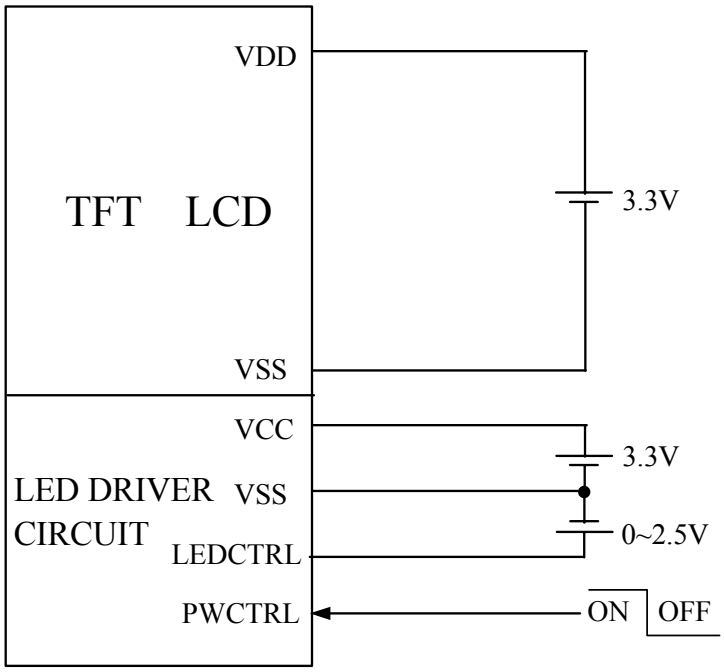
	PWCTRL	REMARK
LOGIC LEVEL H=3.3V L=0V	H	POWER ON
	L	SHUTDOWN

WHEN INTERNAL LED DRIVER : JP4 1-2(DEFAULT)
WHEN EXTERNAL LED DRIVER : JP4 2-3

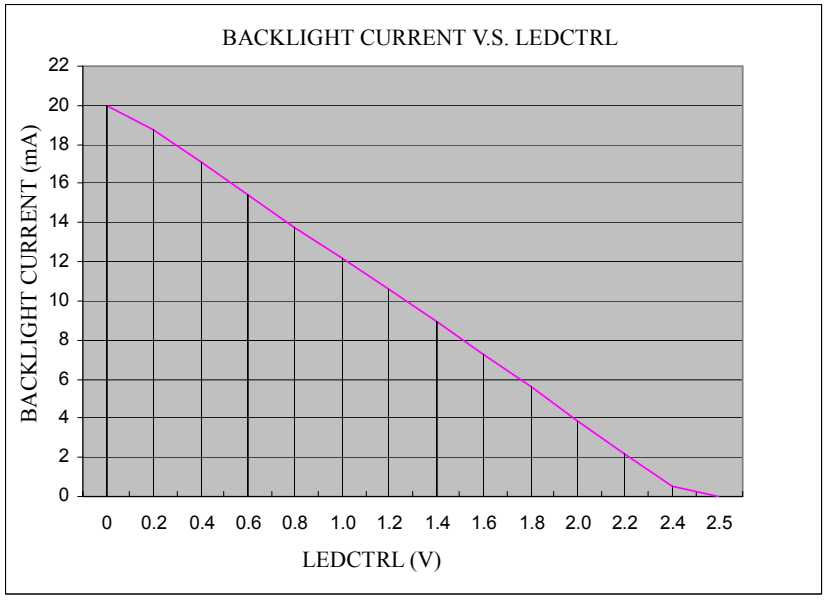
PIN NO	SYMBOL	I/O	FUNCTION
30	VDD	P	POWER SUPPLY VOLTAGE
31	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
32	VSS	P	GROUND (VSS IS CONNECTED TO METAL HOUSING WITH CONDUCTIVE TAPE)
33	VCC	P	POWER SUPPLY FOR LED DRIVER CIRCUIT
34	VCC	P	POWER SUPPLY FOR LED DRIVER CIRCUIT
35	NC	—	NON CONNECTION (USING INTERNAL LED DRIVER) OR ANODE (USING EXTERNAL LED DRIVER) WHEN INTERNAL LED DRIVER：JP1 1-2 (DEFAULT) WHEN EXTERNAL LED DRIVER：JP1 2-3
36	LEDCTRL	I	BRIGHTNESS CONTROL FOR LED BACKLIGHT； LEDCTRL (USING INTERNAL LED DRIVER) OR CATHODE (USING EXTERNAL LED DRIVER) WHEN INTERNAL LED DRIVER：JP2 1-2 (DEFAULT) JP3 1-2 CONNECT(DEFAULT) WHEN EXTERNAL LED DRIVER：JP2 2-3 JP3 NON CONNECTION
37	NC	—	NON CONNECTION
38	NC	—	NON CONNECTION
39	NC	—	NON CONNECTION
40	NC	—	NON CONNECTION

11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



11.2 THE BRIGHTNESS CONTROLLED BY BACKLIGHT CURRENT OF LEDCTRL.



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：35cm±5cm

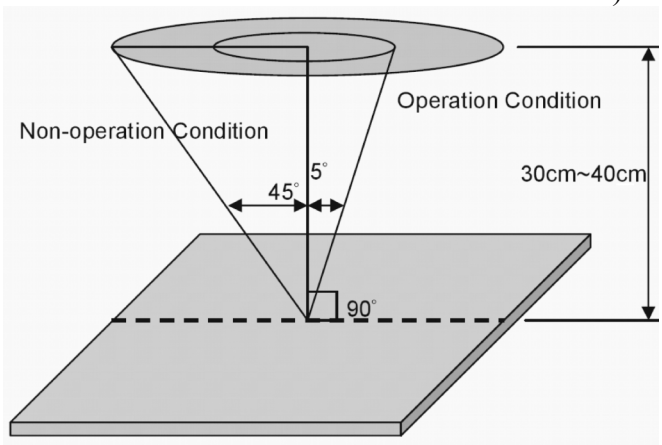
(2)VIEW ANGLE：

NON-OPERATION CONDITION：±5°

(PERPENDICULAR TO LCD PANEL SURFACE)

OPERATION CONDITION：±45°

(PERPENDICULAR TO LCD PANEL SURFACE)



12.2.2 ENVIRONMENT CONDITIONS：

AMBIENT TEMPERATURE		20°C~25°C
AMBIENT HUMIDITY		65±20%RH
AMBIENT ILLUMINATION	COSMETIC INSPECTION	MORE THAN 600Lux
	FUNCTIONAL INSPECTION	300~500 Lux

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：

MIL-STD-105E

NORMAL INSPECTION, SINGLE SAMPLING

LEVEL Ⅱ

(b)AQL：MAJOR DEFECT：AQL 0.65

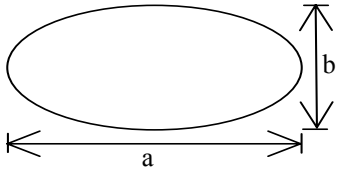
MINOR DEFECT：AQL 1.0

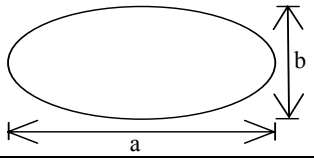
12.3 INSPECTION STANDARDS

12.3.1 VISUAL DEFECTS CLASSIFICATION

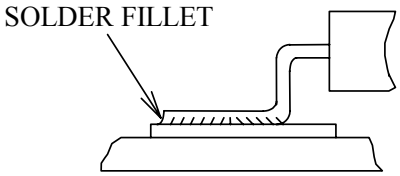
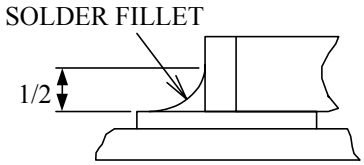
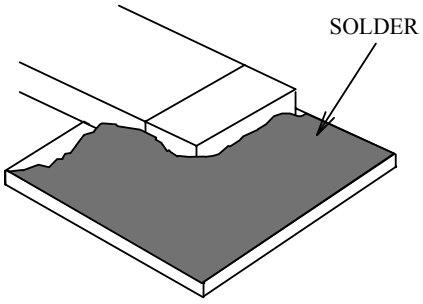
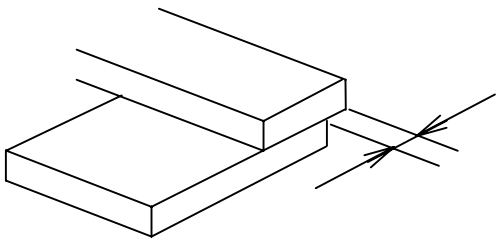
TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	• DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS EX: DISCONNECTION, SHORT CIRCUIT ETC	0.65
	2.BACKLIGHT	• NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION	
	3.DIMENSIONS	• SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS	
MINOR DEFECT	1.DISPLAY ZONE	• BLACK/WHITE SPOT • BUBBLES ON POLARIZER • NEWTON RING • BLACK/WHITE LINE • SCRATCH • CONTAMINATION • LEVER COLOR SPREED	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	

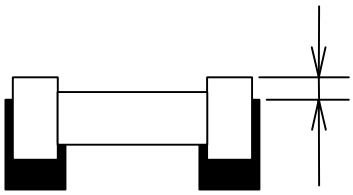
12.3.2 MODULE DEFECTS CALSSIFICATION

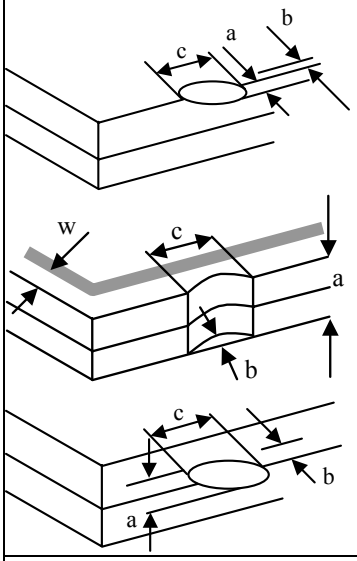
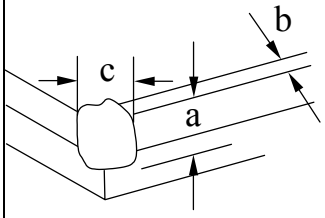
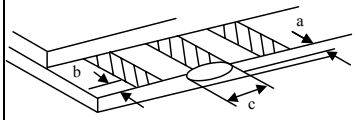
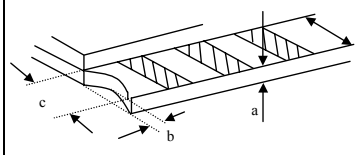
<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td>1.</td><td>DISPLAY ON INSPECTION</td><td>(1)INCORRECT PATTERN
(2)MISSING SEGMENT
(3)DIM SEGMENT
(4)OPERATING VOLTAGE BEYOND SPEC</td></tr>
<tr><td>2.</td><td>OVERALL DIMENSIONS</td><td>(1)OVERALL DIMENSION BEYOND SPEC</td></tr>
<tr><td>3.</td><td>DOT DEFECT</td><td>(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 ≤ 2</td></tr>
<tr><td>DARK DOT</td><td>N ≤ 3</td></tr>
<tr><td>TOAL BRIGHT AND DARK DOTS</td><td>N ≤ 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.
3. DARK DOT：
DOTS APPEAR DARK AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER PURE RED, GREEN, BLUE PICTURE.</td></tr>
<tr><td>4.</td><td>FOREIGN BLACK/WHITE/ BRIGHT LINE/ SCRATCH OF VIEWING AREA</td><td>
<table>
<tr><th>LENGTH：L</th><th>WIDTH：W</th><th>PERMISSIBLE NO.</th></tr>
<tr><td>L ≤ 0.3</td><td>W ≤ 0.05</td><td>IGNORE</td></tr>
<tr><td>0.3 < L ≤ 2.5</td><td>0.05 < W ≤ 0.1</td><td>4</td></tr>
<tr><td>2.5 < L</td><td>0.1 < W</td><td>NONE</td></tr>
</table>
WIDTH：W mm, LENGH： L mm</td></tr>
<tr><td>5.</td><td>FOREIGN MATTER \ BLACK SPOTS \ WHITE SPOTS \ DENT (INCLUDING LIGHT LEAKAGE DUE TO POLARIZING PLATES PINHOLES, ETC.)</td><td>
<table>
<tr><th>AVERAGE DIAMETER (mm): D</th><th>NUMBER OF PIECES PERMITTED</th></tr>
<tr><td>D ≤ 0.15</td><td>IGNORE</td></tr>
<tr><td>0.15 < D ≤ 0.5</td><td>4</td></tr>
<tr><td>0.5 < D</td><td>NONE</td></tr>
</table>
NOTE ：DIAMETER D=(a+b)/2
 
</td></tr>
</table>

<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td>6.</td><td>BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS</td><td>
<table>
<tr><th></th><th>AVERAGE DIAMETER (mm) : D</th><th>NUMBER OF PIECES PERMITTED</th></tr>
<tr><td rowspan="3">BUBBLE ON THE POLARIZER</td><td>D ≤ 0.25</td><td>IGNORE</td></tr>
<tr><td>0.25 < D ≤ 0.5</td><td>N ≤ 5</td></tr>
<tr><td>0.5 < D</td><td>NOTE</td></tr>
<tr><td rowspan="2">SURFACE STATUS</td><td>D < 0.1 mm</td><td>IGNORE</td></tr>
<tr><td>0.1 < D ≤ 0.3mm</td><td>N ≤ 3</td></tr>
<tr><td rowspan="2">CF FAIL / SPOT</td><td>D < 0.1 mm</td><td>IGNORE</td></tr>
<tr><td>0.1 < D ≤ 0.3mm</td><td>N ≤ 3</td></tr>
</table>
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 EXTRANEOUS 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
 

</td></tr>
<tr><td>7.</td><td>LINE DEFECT ON DISPLAY</td><td>OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOW</td></tr>
<tr><td>8.</td><td>MURA ON DISPLAY</td><td>IT'S OK IF MURA IS SLIGHT VISIBLE THROUNG 6% ND FILTER</td></tr>
<tr><td>9.</td><td>UNEVEN COLOR SPREAD, COLORATION</td><td>(1)TO BE DETERMINED BASED UPON THE STANDARD SAMPLE.</td></tr>
<tr><td>10.</td><td>BEZEL APPEARANCE</td><td>(1)BEZEL MAY NOT HAVE RUST, BE DEFORMED OR HAVE FINGER PRINTS STAINS HAVE OTHER CONTAMINATION.
(2)BEZEL MUST COMPLY WITH JOB SPECIFICATIONS.</td></tr>
<tr><td>11</td><td>PCB</td><td>(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.</td></tr>
</table>

NO.	ITEM	CRITERIA
12.	SOLDERING	(1)NO SOLDERING FOUND ON THE SPECIFIED PLACE (2)INSUFFICENT 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 ALIGMENT (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.

<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td rowspan="4">15.</td><td rowspan="4">CRACKED GLASS</td><td colspan="2">THE LCD WITH EXTENSIVE CRACK IS NOT ACCEPTABLE</td></tr>
<tr><td>GENERAL GLASS CHIP：
 
</td><td>
<table>
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>≤ t/2</td><td>< VIEWING AREA</td><td>≤ 1/8X</td></tr>
<tr><td>t/2 > , ≤ 2t</td><td>≤ W/2</td><td>≤ 1/8X</td></tr>
</table>
*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE
X = LCD SIDE LENGTH
t = GLASS THICKNESS
</td></tr>
<tr><td>CORNER PART：
 
</td><td>
<table>
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>≤ t/2</td><td>< VIEWING AREA</td><td>≤ 1/8X</td></tr>
<tr><td>> t/2 , ≤ 2t</td><td>≤ W/2</td><td>≤ 1/8X</td></tr>
</table>
*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE
X = LCD SIDE LENGTH
t = GLASS THICKNESS
</td></tr>
<tr><td>CHIP ON ELECTRODE PAD
 
</td><td>
<table>
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>≤ t</td><td>≤ 0.5mm</td><td>≤ 1/8X</td></tr>
</table>
* X=LCD SIDE WIDTH
t =GLASS THICKNESS
</td></tr>
<tr><td> 
</td><td>
<table>
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>≤ t</td><td>≤ 1/8X</td><td>≤ 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 DEMAGED
</td></tr>
</table>

12.4 RELIABILITY TEST

12.4.1 STANDARD SPECIFICATIONS FOR RELIABILITY OF LCD MODULE

NO	ITEM	DESCRIPTION
1	HIGH TEMPERATURE OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +70°C FOR 240 HRS
2	LOW TEMPERATURE OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -20°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 TEMP / 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: -40°C FOR 30 MINUTES ~ +85°C FOR 30 MINUTES
7	ESD (ELECTROSTATIC DISCHARGE) (NOT OPERATED)	AIR DISCHARGE ± 12KV CONTACT DISCHARGE ± 8KV

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.

12.5 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 12.5, 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

12.6 OPERATION

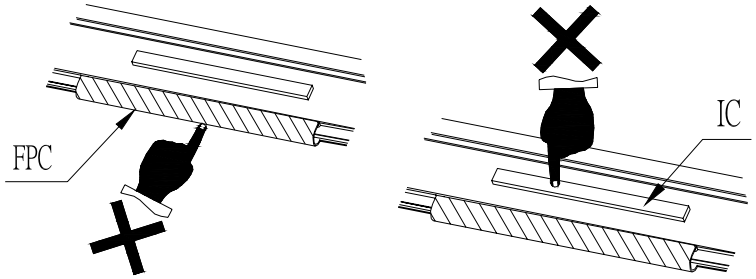
12.6.1 DO NOT CONNECT OR DISCONNECT MODULES TO OR FROM THE MAIN SYSTEM WHILE POWER IS BEING SUPPLIED .

12.6.2 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.

12.6.3 ADJUST THE LC DRIVING VOLTAGE TO OBTAIN THE OPTIMUM CONTRAST .

12.6.4 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 .

12.6.5 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!



12.7 NOTICE

12.7.1 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 .

12.7.2 DO NOT DISASSEMBLE . EDT SHALL NOT BE HELD RESPONSIBLE IF THE MODULE IS DISASSEMBLED AND UPON THE REASSEMBLY THE MODULE FAILED.

12.7.3 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 .

12.7.4 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.

12.7.5 DON’T GIVE EXTERNAL SHOCK.

12.7.6 DON’T APPLY EXCESSIVE FORCE ON THE SURFACE.

12.7.7 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.

12.7.8 DON’T OPERATE IT ABOVE THE ABSOLUTE MAXIMUM RATING.

12.7.9 STORAGE IN A CLEAN ENVIRONMENT, FREE FROM DUST, ACTIVE GAS, AND SOLVENT.

12.7.10 STORE WITHOUT ANY PHYSICAL LOAD.

12.7.11 REWIRING: NO MORE THAN 3 TIMES.