EXAMINED BY : Bob Yu	EMERGING DISPLAY	FILE NO . CAS-0006501
		ISSUE : OCT.23, 2007
APPROVED BY: David Chang	TECHNOLOGIES CORPORATION	TOTAL PAGE : 23
		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

ET024005DMU

(RoHS)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL NO. ET024005DMU	VERSION 1	PAGE 0-1
RECORDS OF REVISION	DOC . FIRST ISSUE OCT.23, 2007		

DATE	REVISED PAGE NO.	SUMMARY

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1. GENERAL SPECIFICATIONS

1.1 APPLICATION NOTES FOR CONTROLLER/DRIVER

PLEASE REFER TO :

HIMAX HX8347-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) DISPLAY SIZE (inch)	----------	2.4”
(2) NUMBER OF DOTS	----------	240W * (RGB) * 320H DOTS
(3) MODULE SIZE	----------	42.72W * 60.26H * 3D mm (WITHOUT FPC SIZE)
(4) ACTIVE AREA	----------	36.72W * 48.96H mm (LCD)
(5) DOT SIZE	----------	0.051W * 0.153H mm
(6) PIXEL SIZE	----------	0.153W * 0.153H mm
(7) LCD TYPE	----------	TFT , TRANSMISSIVE
(8) COLOR	----------	262K (18BIT)
(9) VIEWING DIRECTION	----------	12 O’CLOCK
(10) BACK LIGHT	----------	LED , COLOR : WHITE

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
INPUT POWER SUPPLY	IOVCC/VCI	-0.3	4.6	V	
INPUT VOLTAGE	V_I	- 0.3	VCI+0.3	V	
STATIC ELECTRICITY	—	—	—	V	NOTE (1)
LED BACKLIGHT POWER DISSIPATION	PD	—	324	mW	
LED BACKLIGHT FORWARD CURRENT	IF	—	90	mA	
LED BACKLIGHT REVERBE VOLTAGE	VR	—	5	V	

NOTE(1) : LCM 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	- 2 0 °C	7 0 °C	- 3 0 °C	8 0 °C	NOTE (2), (3)
HUMIDITY	NOTE (4)		NOTE (4)		WITHOUT CONDENSATION
VIBRATION	—	2.45m/S^2 (0.25G)	—	11.76m/S^2 (1.2 G)	5~20Hz , 1HR 20~500Hz(20Hz) , 1HR 20~500Hz(500Hz) , 1HR X,Y,Z,TOTAL 3HRS
SHOCK	—	29.4 m/S^2 (3G)	—	490m/S^2 (50 G)	10 m SECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -30°C : 48HRS MAX .
80°C : 168HRS MAX .
NOTE (3) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE .
NOTE (4) : Ta ≤ 60°C : 90%RH (96HRS MAX .)
Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 60°C.(96 HRS MAX.)

4. ELECTRICAL CHARACTERISTICS

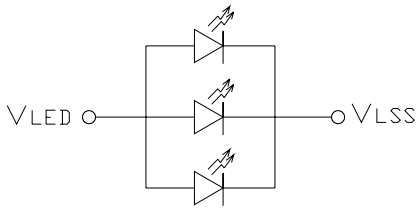
Ta = 25 °C

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY FOR ANALOG	VCI	—	2.3	2.8	3.3	V	
POWER SUPPLY FOR INTERFACE SIGNAL	IOVCC	—	1.65	2.8	3.3	V	
INPUT VOLTAGE NOTE (1)	V_{IH}	H LEVEL	0.8IOVCC	—	IOVCC	V	
	V_{IL}	L LEVEL	-0.3	—	0.2IOVCC	V	
OUTPUT VOLTAGE NOTE (1)	V_{OH}	H LEVEL	0.8IOVCC	—	—	V	
	V_{OL}	L LEVEL	—	—	0.2IOVCC	V	
OUTPUT CURRENT NOTE (2)	IC	—	—	5	10	mA	NOTE (2)
VOLTAGE OF B/L	VF	IF = 60mA	3.0	3.3	3.6	V	NOTE (3)

NOTE (1) : APPLIED TO TERMINALS , NRESET, VSYNC, HSYNC, DOTCLK, ENABLE, R5~R0, G5~G0, B5~B0, SDO, SDI, DNC_SCL, TE.

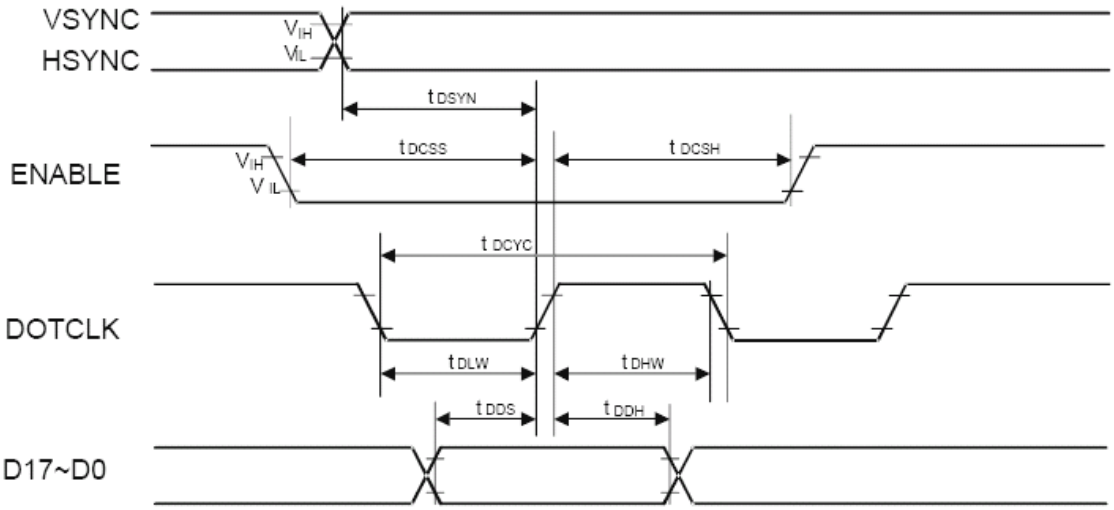
NOTE (2) : IC = I_{VCI} + I_{IOVCC}

NOTE (3) : INTERNAL CIRCUIT DIAGRAM



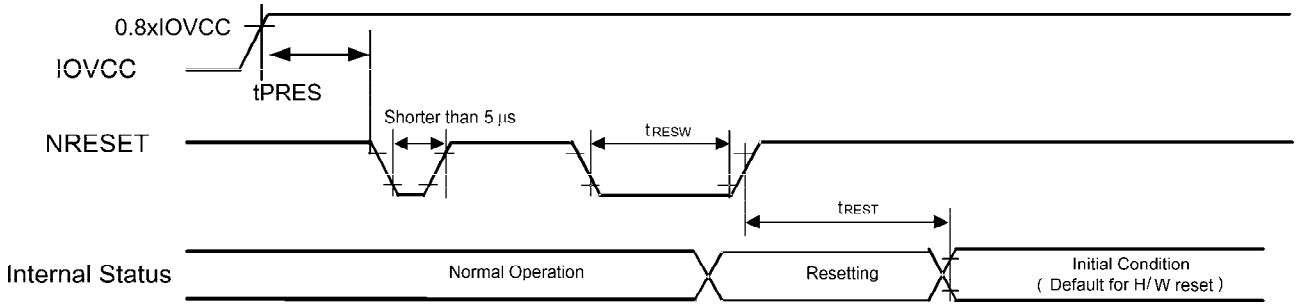
5. TIMING CHARACTERIS TICS

5.1 RGB INTERFACE CHARACTISTICS



SYMBOL	PARAMETER	CONDITIONS	RELATED PINS	MIN.	TYP.	MAX.	UNIT
t_{DCYC}	DOTCLK CYCLE TIME	VRR= Min.50Hz Max .65Hz	DOTCLK	100 (NOTE2)	—	226 (NOTE3)	ns
t_{DLW} t_{CHW}	DOTCLK LOW TIME DOTCLK HIGH TIME			50 15	—	— —	ns
t_{DDS} t_{DDH}	RGB DATA SETUP TIME RGB DATA HOLD TIME	—	DOTCLK D17~D0	15 15	— —	— —	ns
t_{DCSS} t_{DCSH}	ENABLE SETUP TIME ENABLE HOLD TIME	—	ENABLE	15 15	—	—	ns
t_{DSYN}	SYNC SETUP TIME	—	DOTCLK HSYNC,VSYNC	15	—	—	ns

5.2 RESET INPUT TIMING



SYMBOL	PARAMETER	RELATED PINS	Min.	Typ.	Max.	NOTE	UNIT
t_{RESW}	RESET LOW PULSE WIDTH(1)	NRESET	10	—	—	—	µs
t_{REST}	RESET COMPLETE TIME(2)	—	—	—	5	WHEN RESET APPLIED DURING STB MODE	ms
		—		—	120	WHEN RESET APPLIED DURING STB MODE	ms
t_{PRES}	RESET GOES HIGH LEVEL AFTER POWER ON TIME	NRESET & IOVCC	1	—	—	RESET GOES HIGH LEVEL AFTER POWER ON	ms

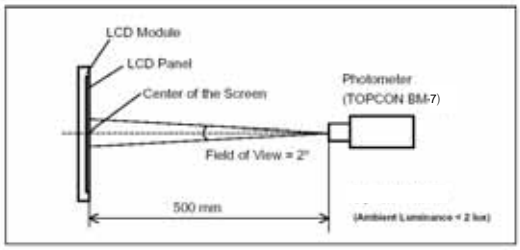
6. OPTICAL CHARACTERISTICS NOTE (1)

Ta = 25 °C

ITEM		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	REMARK
VIEWING ANGLE	HOR.	θx+	CENTER CR≥10	θy=0°	60	65	—	deg .	NOTE(2)
		θx-			35	40	—		
	VER.	θy+		θx=0°	60	65	—		
		θy-			25	30	—		
CONTRAST RATIO		CR	θx = θy = 0°		200	250	—		NOTE(2)
RESPONSE TIME		t r (rise)	θx = θy = 0°		—	10	20	ms	NOTE(2)
		t f (fall)	θx = θy = 0°		—	20	30		
THE BRIGHTNESS OF MODULE		B	IF = 60mA θx = θy = 0°		250	300	—	cd/m^2	NOTE(3)
COLOR OF CIE COORDINATE	RED	X_R	VIEWING NORMAL ANGLE θx = θy = 0° NTSC = 60%		0.587	0.617	0.647	—	—
		Y_R			0.312	0.342	0.372		
	GREEN	X_G			0.293	0.323	0.352	—	—
		Y_G			0.571	0.601	0.631		
	BLUE	X_B			0.112	0.142	0.172	—	—
		Y_B			0.047	0.077	0.107		
	WHITE	X_W			0.250	0.300	0.350	—	—
		Y_W			0.270	0.320	0.370		
THE BRIGHTNESS OF UNIFORMITY		—	—		70	75	—	—	NOTE(3) NOTE(4)

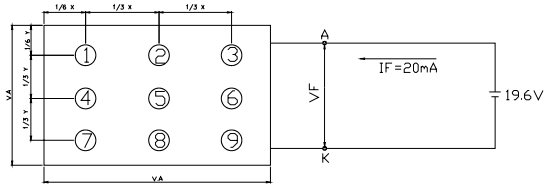
NOTE (1) : TEST EQUIPMENT SETUP :

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 2° AT A DISTANCE OF 50cm AND NORMAL DIRECTION.



NOTE (2) : PLEASE REFER TO 12.3 DEFINITION OF OPTICAL CHARACTERISTICS.

NOTE (3) : THE BRIGHTNESS TEST METHOD (BRIGHTNESS MEASURED WHEN LCD IS AT " WHITE STATE")

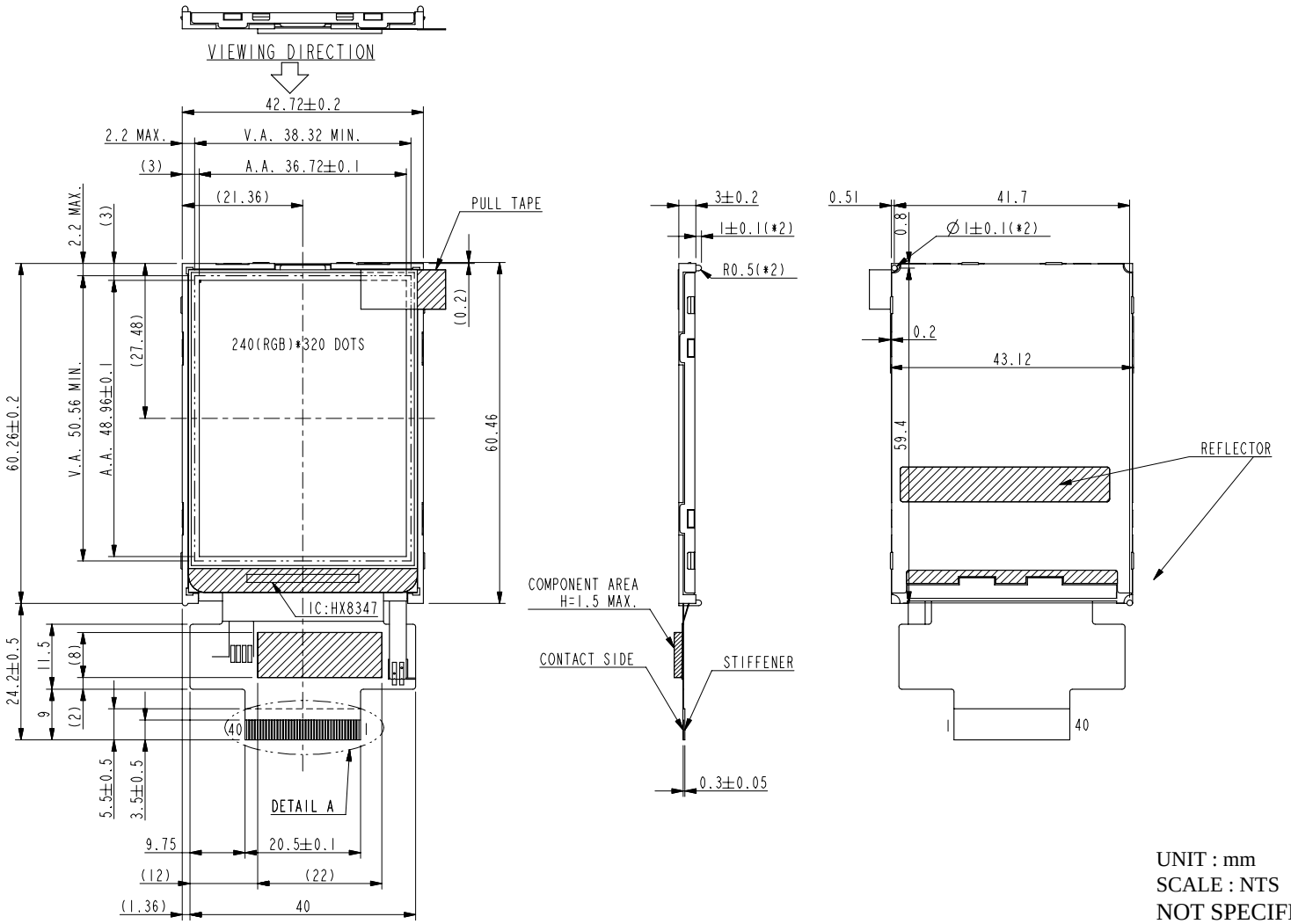


ADD POWER TO LED, A、K PIN TEST POINT ARE ①~⑨

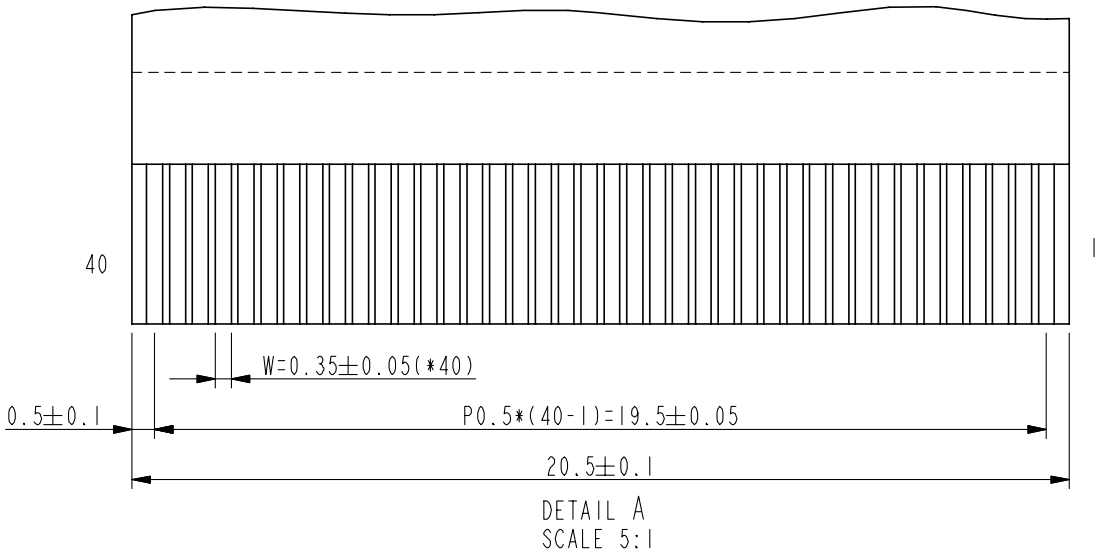
NOTE (4) : TNE BRIGHTNESS VNIFORMITY CALCULATE METHOD

$$\text{UNIFORMITY}: \left[1 - \frac{\text{MAXIMUN BRIGHTESS} - \text{MINIMUN BRIGHTESS}}{\text{AVERAGE BRIGHTESS}}\right] \times 100\%$$

7 . OUTLINE DIMENSIONS

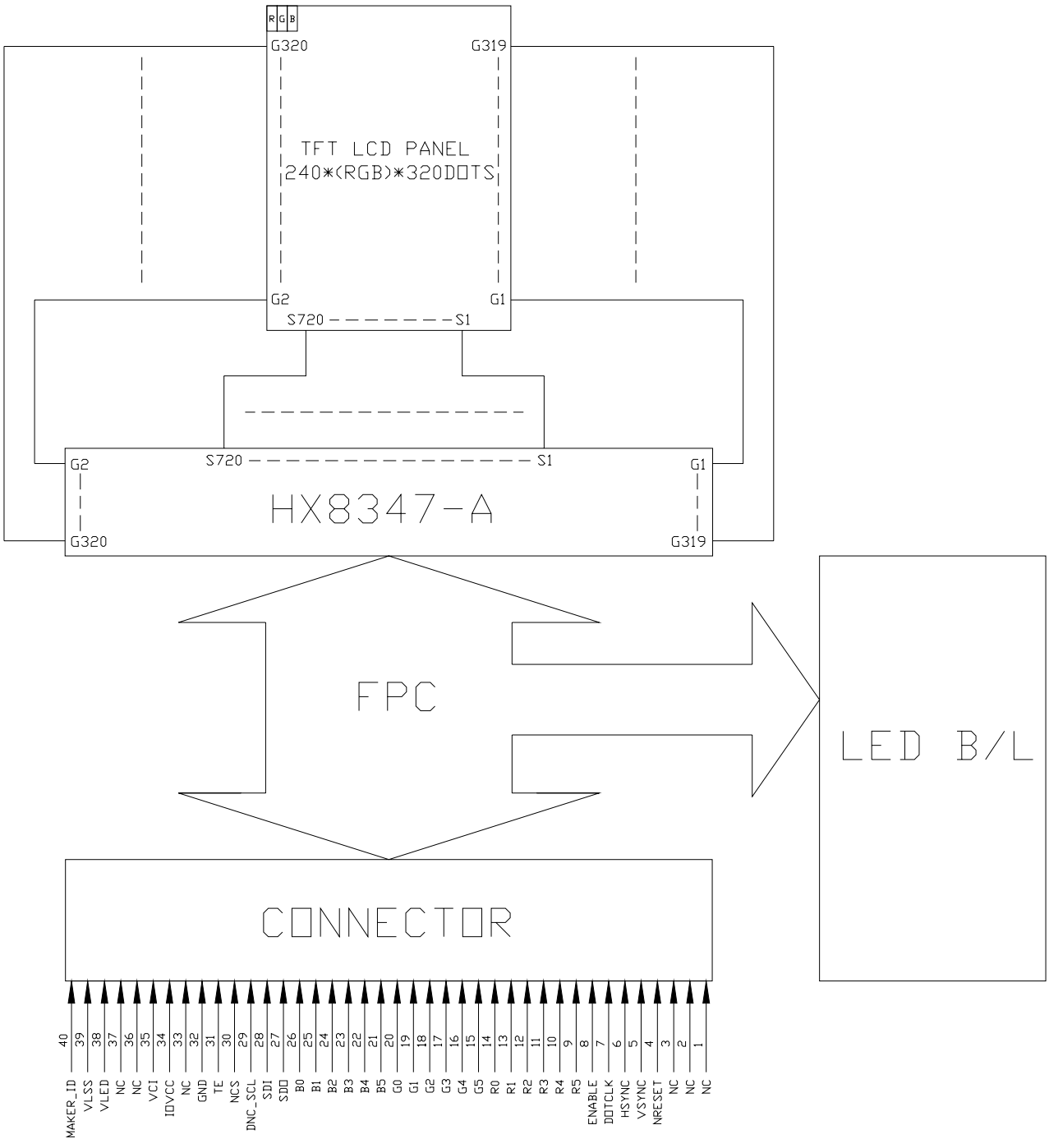


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.3

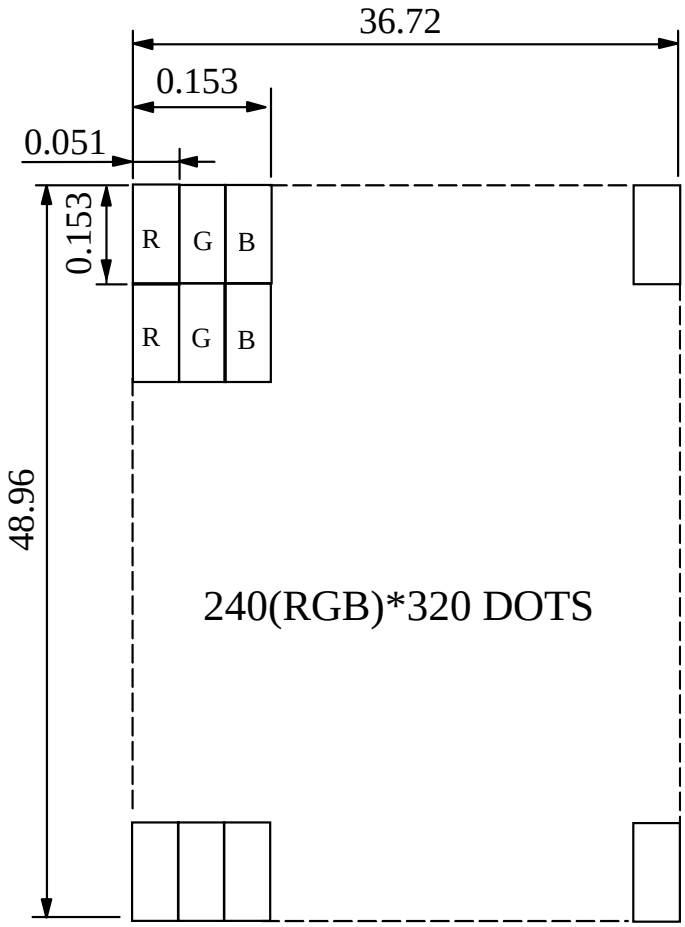


DETAIL A
SCALE 5:1

8 . BLOCK DIMENSION



9. DETAIL DRAWING OF DOT MATRIX



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

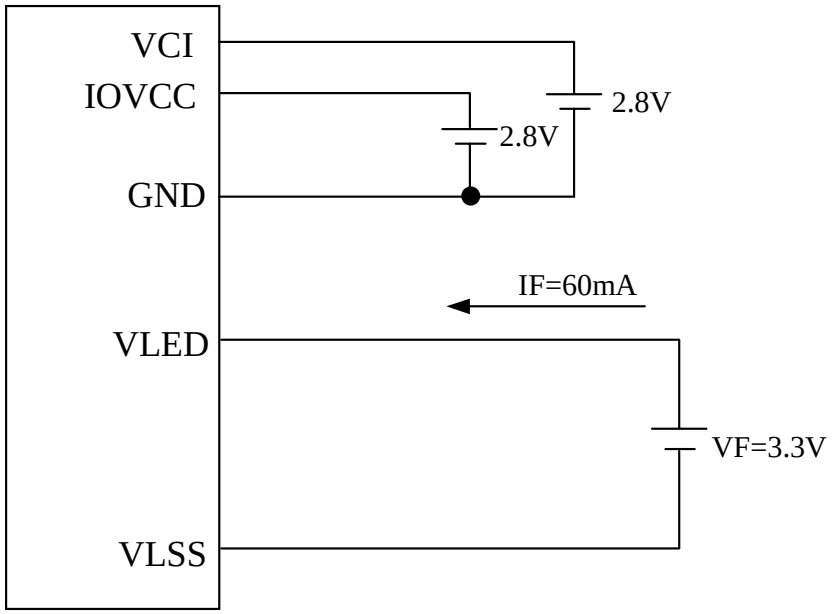
10. INTERFACE SIGNALS

10.1 LCD MODULE CONNECTOR

PIN NO	SYMBOL	FUNCTION
1	NC	NOT CONNECTION
2	NC	NOT CONNECTION
3	NC	NOT CONNECTION
4	NRESET	RESET
5	VSYNC	VERTICAL SYNCHRONIZING SIGNAL
6	HSYNC	HORIZONTAL SYNCHRONIZING SIGNAL
7	DOTCLK	DOT CLOCK SIGNAL
8	ENABLE	DATA ENABLE SIGNAL
9	R5	DATA BUS 16-BIT BUS：USE PIN 9-13, PIN 15-25 AND R0, B0 UNUSED 18-BIT BUS：USE PIN 9-26 CONNECTED UNUSED PINS TO THE VSSD LEVEL
10	R4	
11	R3	
12	R2	
13	R1	
14	R0	
15	G5	
16	G4	
17	G3	
18	G2	
19	G1	
20	G0	
21	B5	
22	B4	
23	B3	
24	B2	
25	B1	
26	B0	
27	SDO	SERIAL INSTRUCTION DATA OUTPUT
28	SDI	SERIAL INSTRUCTION DATA INPUT
29	DNC_SCL	SERIAL CLOCK
30	NCS	CHIP SELECT SIGNAL
31	TE	TEARING EFFECT OUTPUT , IF NOT USE LET IT TO OPEN
32	GND	GROUND
33	NC	NOT CONNECTION
34	IOVCC	POWER SUPPLY FOR INTERFACE SIGNAL
35	VCI	POWER SUPPLY FOR ANALOG
36	NC	NOT CONNECTION
37	NC	NOT CONNECTION
38	VLED	POWER SUPPLY FOR LED (+)
39	VLSS	POWER SUPPLY FOR LED (-)
40	MAKER_ID	MAKER IDENTIFICATION(MAY ESTABLISH “H”, ”L” OR ”NC”) IF THE CUSTOMER HAS TWO ABOVE THE MAKER, CAN USE THIS PIN DECISION MAKER’S ID AND DETECTS THE CODE BY THE MPU, AND MUST DESIGN THIS PIN ON THE MAIN BOARD. IF NOT USED, LET IT TO OPEN.

11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



NOTE : IOVCC ≤ VCI .

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

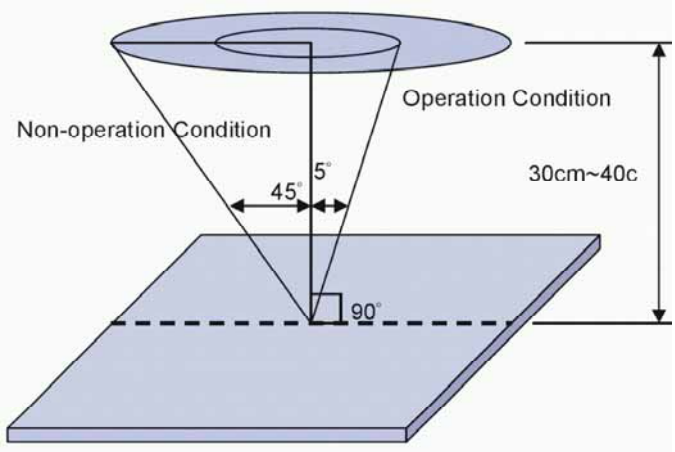
(2)VIEW ANGLE :

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

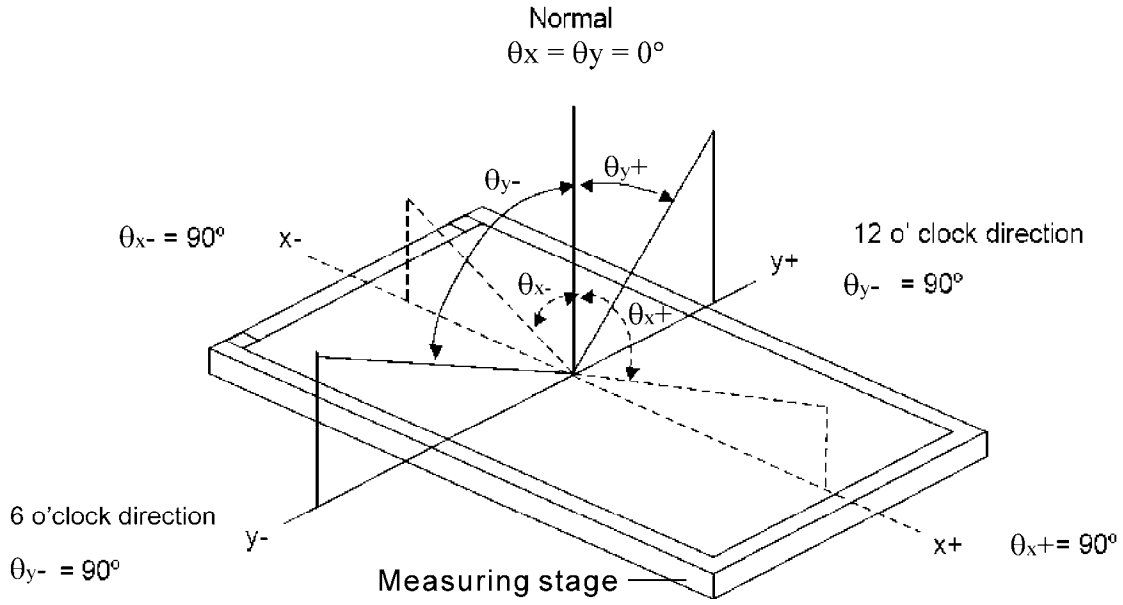
(b)AQL：MAJOR DEFECT：AQL 0.65

MINOR DEFECT：AQL 2.5

TOTAL DEFFCTS：AQL 2.5

12.3 DEFINITION OF OPTICAL CHARACTERISTICS

12.3.1 DEFINITION OF VIEWING ANGLE θx AND θy

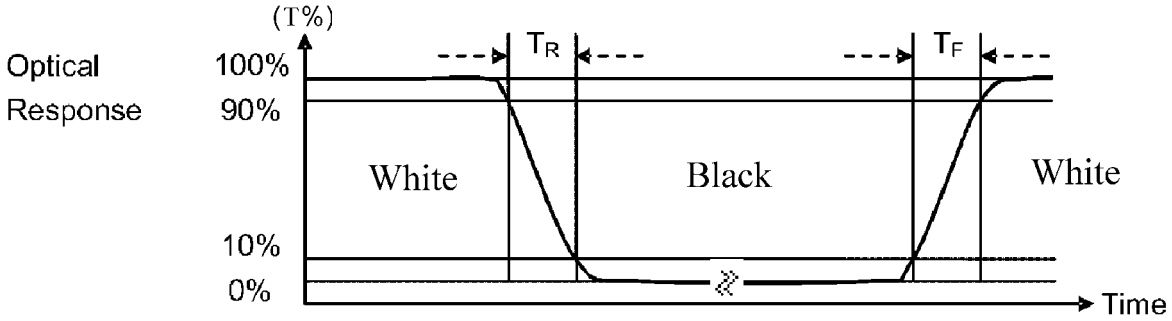


12.3.2 DEFINITION OF CONTRAST RATIO

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

12.3.3 DEFINITION OF RESPONSE TIME : (T_R AND T_F)

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



MEASURED AT THE CENTER AREA OF THE PANEL WHEN ALL THE INPUT TERMINALS OF LCD PANEL ARE ELECTRICALLY OPENED.

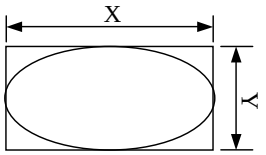
12.4 INSPECTION STANDARDS

12.4.1 VISUAL DEFECTS CLASSIFICATION

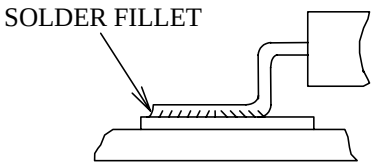
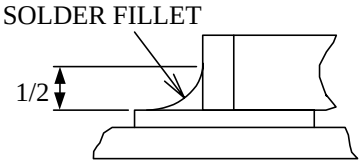
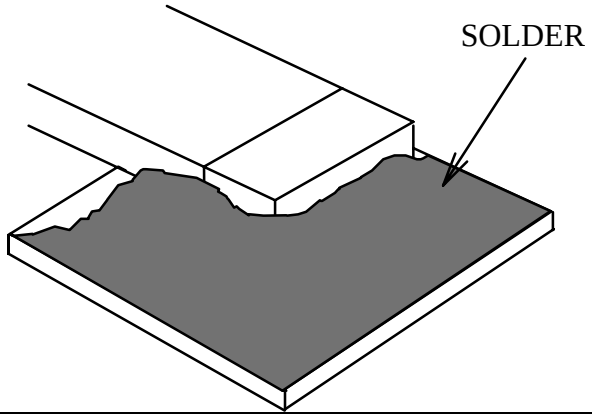
TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	• DEFECT TO MISS SPECIFIED DISPLAY FUNCTION , FOR ALL AND SPECIFIED DOTS EX : DISCONNECTION , SHORT CIRCUIT ETC	0.65
	2.BACKLIGHT	• NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION	
	3.DIMENSIONS	• SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS	
MINOR DEFECT	1.DISPLAY ZONE	• BLACK/WHITE SPOT • BUBBLES ON POLARIZER • BLACK/WHITE LINE • SCRATCH • CONTAMINATION • LEVER COLOR SPREED	2.5
	2.BEZEL ZONE	• STAINS • SCRATCHES • FOREIGN MATTER	
	3.PCB	• CRACKS • SCRATCHES • STAINS	
	4.SOLDERING	• INSUFFICIENT SOLDER • SOLDERED IN INCORRECT POSITION • CONVEX SOLDERING SPOT • SOLDER BALLS • SOLDER SCRAPS	
	5.DISPLAY ON (ALL ON)	• LIGHT LINE	

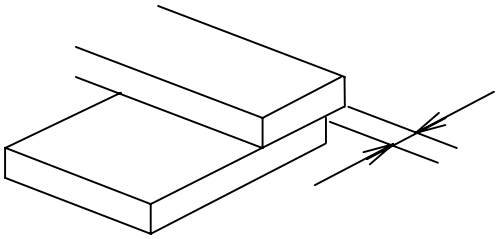
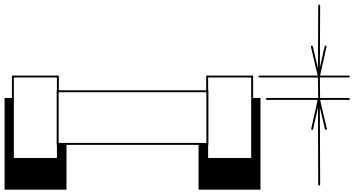
12.4.2 MODULE DEFECTS CLASSIFICATION

<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>BLACK SPOT Ⅰ
WHITE SPOT Ⅰ
ON-DISPLAY</td><td>(1)INSPECTION PATTERN : FULL WHITE,FULL BLACK,RED,GREEN AND BLUE SCREENS.
(2)
<table>
<tr><td rowspan="5">DOT DEFECT</td><td>BRIGHT DOT</td><td>N≤3</td></tr>
<tr><td>DARK DOT</td><td>N≤3</td></tr>
<tr><td>TOTAL DOT</td><td>N≤3</td></tr>
<tr><td>MINIMUM DISTANCE BETWEEN BRIGHT DOTS</td><td>L≥5mm</td></tr>
<tr><td>MINIMUM DISTANCE BETWEEN BRIGHT DOTS AND DARK DOTS</td><td>L≥5mm</td></tr>
<tr><td></td><td>MINIMUM DISTANCE BETWEEN DARK DOTS</td><td>L≥5mm</td></tr>
</table>
NOTE : THE DEFINITION OF DOT DEFECT:THE DOT DEFECT WAS JUDGED AFTER REPAIR AND THE SIZE OF A DEFECTIVE DOT OVER 1/2 OF WHOLE DOT IS REGARDED AS ONE DEFECTIVE DOT.</td></tr>
<tr><td>4.</td><td>BLACK LINE
WHITE LINE
ON-DISPLAY</td><td>(1)THE FOLLOWING BLACK LINE , WHITE LINE ARE WITHIN THE VIEWING AREA .
WIDTH : Wmm , LENGH : Lmm
<table>
<tr><th>LENGTH : L</th><th>WIDTH : W</th><th>PERMISSIBLE NO.</th></tr>
<tr><td>L ≤ 0.5</td><td>W ≤ 0.1</td><td>IGNORE</td></tr>
<tr><td>0.5 < L ≤ 3</td><td>0.1 < W ≤ 0.5</td><td>3</td></tr>
<tr><td>3 < L</td><td>0.5 ≤ W</td><td>NONE</td></tr>
</table></td></tr>
</table>

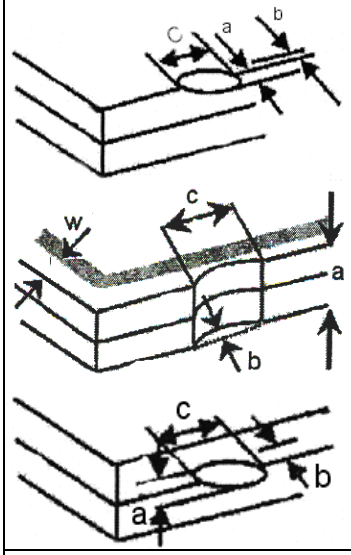
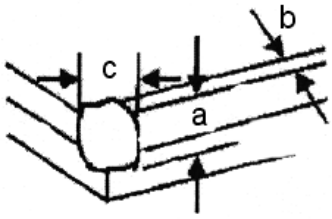
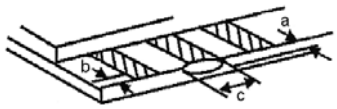
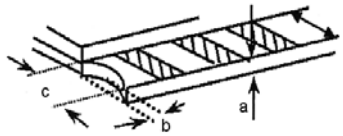
<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td>5.</td><td>BUBBLES OF POLARIZER /SURFACE STAINS /DIRT/CF FAIL /SPOT</td><td>
<table>
<tr><td rowspan="5">BUBBLE ON THE POLARIZER</td><td rowspan="2">LINE SHAPE L:LENGTH(mm)</td><td>L ≤ 0.5, W ≤ 0.1</td><td>LGNORE</td></tr>
<tr><td>0.5 < L ≤ 3
0.1< W ≤ 0.5</td><td>N ≤ 2</td></tr>
<tr><td rowspan="3">DOT SHAPE D:AVERAGE DIAMETER(mm)</td><td>D ≤ 0.25</td><td>LGNORE</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 colspan="2" 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 colspan="2" 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)=(X+Y)/2 , WHERE


</td></tr>
<tr><td>6.</td><td>SCRATCHES AND DENT ON GLASS POLARIZER</td><td>(1) PLS REFER TO THE ABOVE NO.3 AND 4 TO DETERMINE SCRATCHES AND DENT ON POLARIZER OR GLASS</td></tr>
<tr><td>7.</td><td>UNEVEN COLOR SPREAD , COLORATION</td><td>(1)TO BE DETERMINED BASED UPON THE STANDARD SAMPLE .</td></tr>
<tr><td>8.</td><td>BEZEL APPEARANCE</td><td>(1)BEZEL MAY NOT HAVE RUST ,BE DEFORMED OR HAVE FINGER PRINTS STAINS OF OTHER CONTAMINATION .
(2)BEZEL MUST COMPLY WITH JOB SPECIFICATIONS .</td></tr>
</table>

NO.	ITEM	CRITERIA
9.	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 

NO.	ITEM	CRITERIA
9.	SOLDERING	(3)PARTS ALIGMENT (a)LSI , IC LEAD WIDTH IS MORE THAN 50% BEYOND PAD OUTLINE  (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.
10.	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.

NO.	ITEM	CRITERIA
11.	PCB , COB	(1)COB SEAL MAY NOT HAVE PINHOLES LARGER THAN 0.2mm OR CONTAMINATION. (2)COB SEAL SURFACE MAY NOT HAVE PINHOLES THROUGH TO THE IC. (3)THE HEIGHT OF THE COB SHOULD NOT EXCEED THE HEIGHT INDICATED IN THE ASSEMBLY DIAGRAM. (4)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. (5)NO OXIDATION OR CONTAMINATION PCB TERMINALS (6)PARTS ON PCB MUST BE THE SAME AS ON THE PRODUCTION CHARACTERISTIC CHART. THERE SHOULD BE NO WRONG PARTS , MISSING PARTS OR EXCESS PARTS . (7)THE JUMPER ON THE PCB SHOULD CONFORM TO THE PRODUCT CHARACTERISTIC CHART. (8)IF SOLDER GETS ON BEZEL TAB PADS,LED PAD, ZEBRA PAD OR SCREW HOLD PAD,MAKE SURE IT IS SMOOTHED DOWN .
12.	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="6">13.</td><td rowspan="6">CRACKED GLASS</td><td colspan="4">THE LCD WITH EXTENSIVE CRACK IS NOT ACCEPTABLE</td></tr>
<tr><td>General glass chip :
  </td><td colspan="3"><table><tr><td>a</td><td>b</td><td>c</td></tr><tr><td>≤ t/2</td><td>< VIEWING AREA</td><td>≤ 1/8X</td></tr><tr><td>t/2 > , ≤ 2t</td><td>≤ W/3</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 colspan="3"><table><tr><td>a</td><td>b</td><td>c</td></tr><tr><td>≤ t/2</td><td>< VIEWING AREA</td><td>≤ 1/8X</td></tr><tr><td>> t/2 , ≤ 2t</td><td>≤ W/3</td><td>≤ 1/8X</td></tr></table>*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE
X=LCD SIDE LENGTH
Y=GLASS THICKNESS</td></tr>
<tr><td>CHIP ON ELECTRODE PAD
  </td><td colspan="3"><table><tr><td>a</td><td>b</td><td>c</td></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 colspan="3"><table><tr><td>a</td><td>b</td><td>c</td></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>

12.5 RELIABILITY TEST

12.5.1 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 TEMPERATURE / HUMIDITY TEST	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 40°C, 90% RH 240 hrs
6	HIGH TEMPERATURE / HIGH HUMIDITY STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 40°C, 90% RH 240 hrs
7	THERMAL SHOCK (NOT OPERATED)	THE SAMPLE SHOULD BE ALLOWED TO STAND THE FOLLOWING 10 CYCLES OF OPERATION : -30°C FOR 30 MINUTES +80°C FOR 30 MINUTES
8	ESD (ELECTROSTATIC DISCHARGE)	AIR DISCHARGE ± 15KV CONTACT DISCHARGE ± 8KV

12.5.2 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 6.2 , 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

12.5.3LIFE TIME

LIFE TIME	FUNCTIONS , PERFORMANCE , APPEARANCE , ETC . SHALL BE FREE FROM REMARKABLE DETERIORATION WITHIN 50,000 HOURS UNDER ORDINARY OPERATING AND STORAGE CONDITIONS ROOM TEMPERATURE (25±10°C) , NORMAL HUMIDITY (45±20% RH) , AND IN AREA NOT EXPOSED TO DIRECT SUN LIGHT. (LIFE TIME OF BACKLIGHT , PLEASE REFER TO DATA ABOUT BACKLIGHT .)

NOTE : FROM OUR EXPERIENCE THE LIFE TIME OF HIGH HUMIDITY OPERATION AND HIGH TEMPERATURE OPERATION AS ABOVE MENTIONED COULD BE ACHIEVED.

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 (5 ±0.25v) .
If above sequence is not followed , CMOS LSIs of LCD modules may be damaged due to latch - up problem .

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 .