

EXAMINED BY :	EMERGING DISPLAY	FILE NO . CAS-0007525
Yung Chang Hu		ISSUE : MAY.31, 2012
APPROVED BY:	TECHNOLOGIES CORPORATION	TOTAL PAGE : 22
David Chang		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

ET024010DMU

(RoHS)

FOR MESSRS : _____

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO.	VERSION	PAGE
ET024010DMU	1	0-1

RECORDS OF REVISION	DOC . FIRST ISSUE	MAY.31, 2012
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DATE	REVISED PAGE NO.	SUMMARY
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1. GENERAL SPECIFICATIONS

1.1 DATA SHEETS FOR CONTROLLER/DRIVER
PLEASE REFER TO :

HIMAX HX8347-I

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	-----	2.4 inch
(2) NUMBER OF DOTS	-----	240W * (RGB) * 320H DOTS
(3) MODULE SIZE	-----	42.72W * 60.26H * 3D mm (WITHOUT FPC SIZE)
(4) EFFECTIVE AREA	-----	38.32W * 50.56H mm
(5) ACTIVE AREA	-----	36.72W * 48.96H mm
(6) DOT SIZE	-----	0.051W * 0.153H mm
(7) PIXEL SIZE	-----	0.153W * 0.153H mm
(8) LCD TYPE	-----	TFT, TRANSMISSIVE
(9) COLOR	-----	262K (18BIT)
(10) VIEWING DIRECTION	-----	12 O'CLOCK
(11) BACK LIGHT	-----	LED, COLOR : WHITE
(12) INTERFACE MODE	-----	RGB (18 BIT) PARALLEL

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	
STATIC ELECTRICITY	—	—	—	V	NOTE (1)
LED BACKLIGHT POWER DISSIPATION	PD	—	324	mW	
LED BACKLIGHT FORWARD CURRENT	IF	—	90	mA	
LED BACKLIGHT REVERSE 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 ms 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

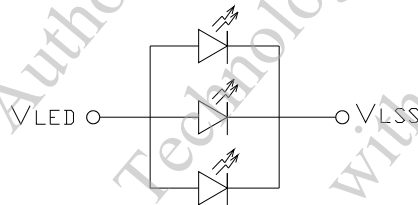
Ta = 25 °C

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	0.7IOVCC	—	IOVCC	V	
	V _{IL}	L LEVEL	GND	—	0.3IOVCC	V	
OUTPUT VOLTAGE NOTE (1)	V _{OH}	H LEVEL	0.8IOVCC	—	IOVCC	V	
	V _{OL}	L LEVEL	GND	—	0.2IOVCC	V	
OUTPUT CURRENT	IC	—	—	5	10	mA	NOTE (2)
POWER SUPPLY FOR LED BACKLIGHT	V _{LED} -V _{LSS}	IF = 60mA	3.0	3.3	3.6	V	NOTE (3)
LED LIFT TIME	—	I _{LED} =20mA (PER.LED) 30K	—	—	—	hrs	NOTE (5) NOTE (6)

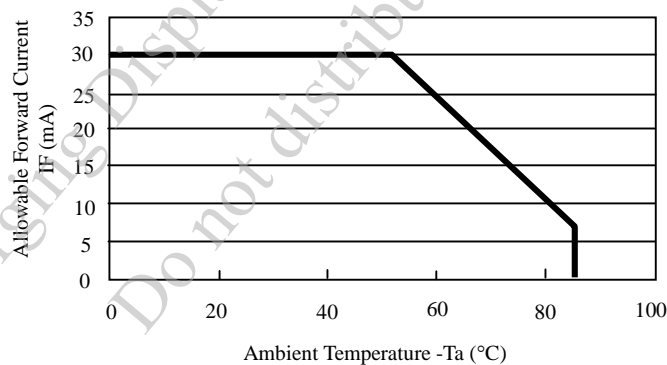
NOTE (1) : APPLIED TO TERMINALS , NRESET, VSYNC, HSYNC, DOTCLK, ENABLE, R5~R0, G5~G0, B5~B0, SDO, SDI, DNC_SCL, TE.

NOTE (2) : IC = I_{vci} + I_{iovcc}

NOTE (3) : INTERNAL CIRCUIT DIAGRAM



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

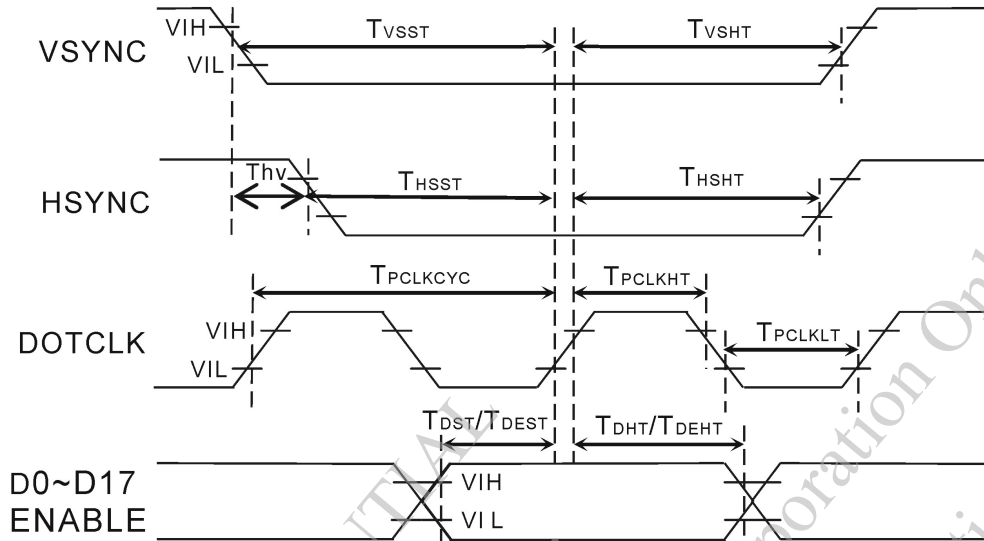


NOTE (5) : CONDITIONS; TA=25 °C, CONTINUOUS LIGHTING

NOTE (6) : DEFINITIONS OF FAILURE

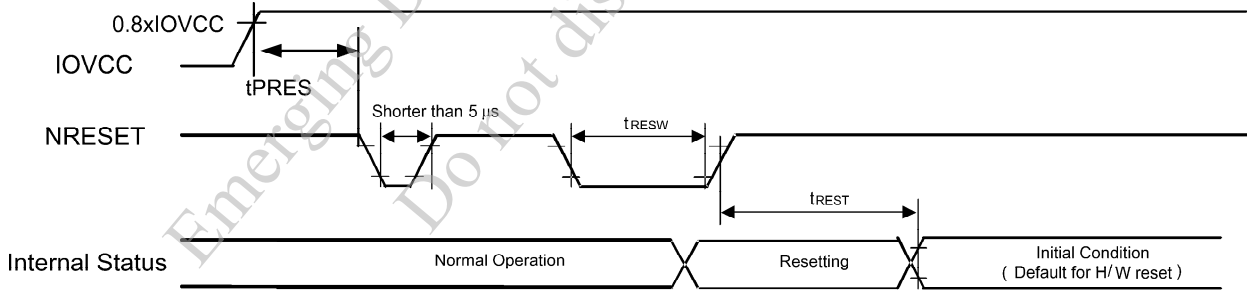
- A. LCD LUMINANCE BECOMES HALF OF THE MINIMUM VALUE.
- B. LED DOESN'T LIGHT NORMALLY

5. TIMING CHARACTERISTICS
5.1 RGB INTERFACE CHARACTERISTICS



ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
PIXEL LOW PULSE WIDTH	TCLKLT	—	15	—	—	ns
PIXEL HIGH PULSE WIDTH	TCLKHT	—	15	—	—	ns
VERTICAL SYNC. SET-UP TIME	TVSSST	—	15	—	—	ns
VERTICAL SYNC. HOLD TIME	TVSSH	—	15	—	—	ns
HORIZONTAL SYNC. SET-UP TIME	THSST	—	15	—	—	ns
HORIZONTAL SYNC. HOLD TIME	THSH	—	15	—	—	ns
ENABLE SET-UP TIME	TDEST	—	15	—	—	ns
ENABLE HOLD TIME	TDEHT	—	15	—	—	ns
DATA SET-UP TIME	TDST	—	15	—	—	ns
DATA HOLD TIME	TDHT	—	15	—	—	ns
PHASE DIFFERENCE OF SYNC SIGNAL FALLING EDGE	Thv	—	0	—	240	DOTCLK

5.2 RESET INPUT TIMING



SYMBOL	PARAMETER	RELATED PINS	Min.	Typ.	Max.	NOTE	UNIT
tRESW	RESET LOW PULSE WIDTH	NRESET	10	—	—	—	μs
tREST	RESET COMPLETE TIME	—	5	—	—	WHEN RESET APPLIED DURING STB OUT MODE	ms
		—	120	—	—	WHEN RESET APPLIED DURING STB MODE	ms
tPRES	RESET GOES HIGH LEVEL AFTER POWER ON TIME	NRESET & IOVCC	1	—	—	RESET GOES HIGH LEVEL AFTER POWER ON	ms

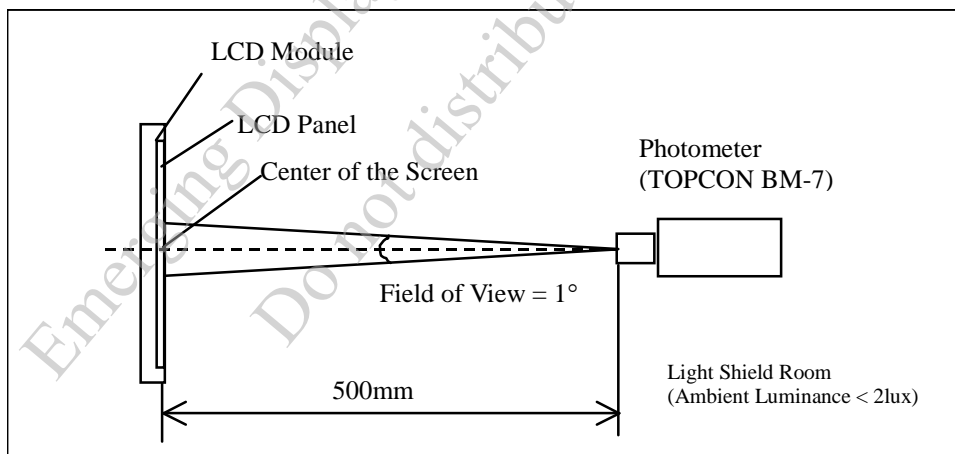
6. OPTICAL CHARACTERISTICS NOTE (1)
6.1 OPTICAL CHARACTERISTICS

Ta = 25 °C

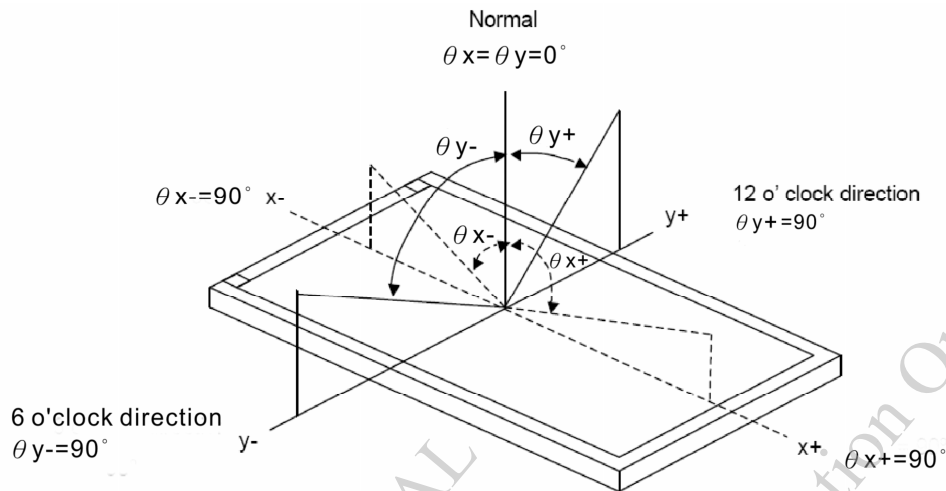
I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
VIEWING ANGLE	HOR.	θ_{x+}	CENTER CR \geq 10	$\theta_{y=0^\circ}$	58	65	—	deg . NOTE(2) NOTE(3)
		θ_{x-}			48	55	—	
	VER.	θ_{y+}		$\theta_{x=0^\circ}$	58	65	—	
		θ_{y-}			28	35	—	
CONTRAST RATIO		CR	$\theta_x = \theta_y = 0^\circ$	200	250	—	NOTE(3)	
RESPONSE TIME		Tr + Tf	$\theta_x = \theta_y = 0^\circ$	—	30	—	ms	NOTE(4)
THE BRIGHTNESS OF MODULE		B	IF = 60mA $\theta_x = \theta_y = 0^\circ$	250	300	—	cd/m ²	NOTE(5)
COLOR OF CIE COORDINATE	RED	Rx	IF = 60mA $\theta_x = \theta_y = 0^\circ$ NTSC = 60%	0.560	0.610	0.660	—	NOTE(6)
		Ry		0.300	0.350	0.400		
	GREEN	Gx		0.280	0.330	0.380		
		Gy		0.560	0.610	0.660		
	BLUE	Bx		0.092	0.142	0.192		
		By		0.050	0.100	0.150		
	WHITE	Wx		0.250	0.300	0.350		
		Wy		0.280	0.330	0.380		
THE BRIGHTNESS OF UNIFORMITY		—	—	70	75	—	—	—

NOTE (1) : TEST EQUIPMENT SETUP :

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. 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 :

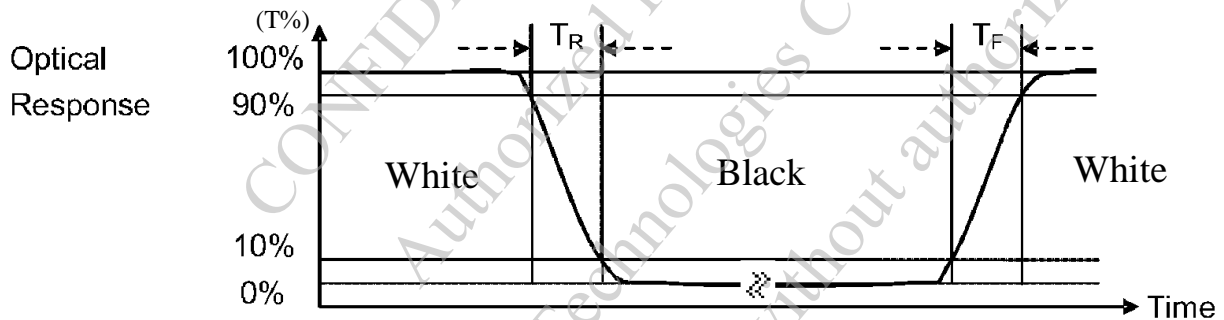


NOTE (3) : DEFINITION OF CONTRAST RATIO :

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

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

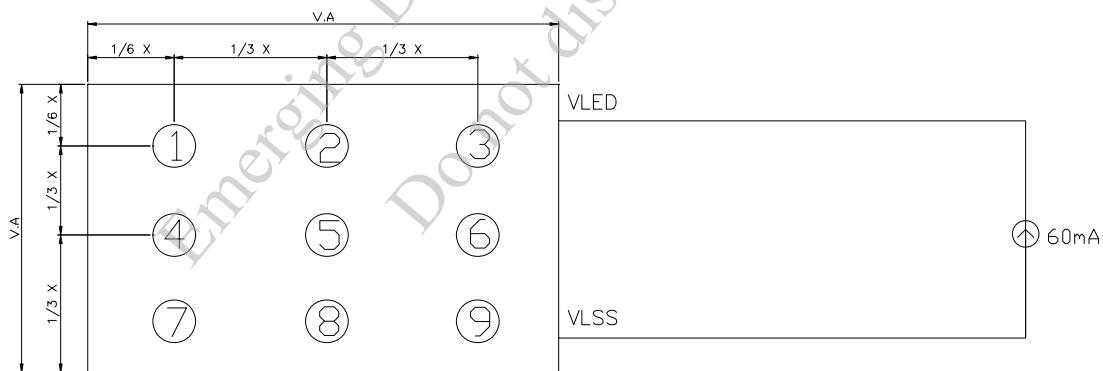
THE FIGURE BELOW IS THE OUTPUT SIGNAL OF THE PHOTO DETECTOR.



NOTE (5) : BRIGHTNESS MEASURED WHEN LCD IS AT "WHITE STATE"

NOTE (6) : THE 100% TRANSMISSION IS DEFINED AS THE TRANSMISSION OF LCD PANEL WHEN ALL THE INPUT TERMINALS OF MODULE ARE ELECTRICALLY OPENED.

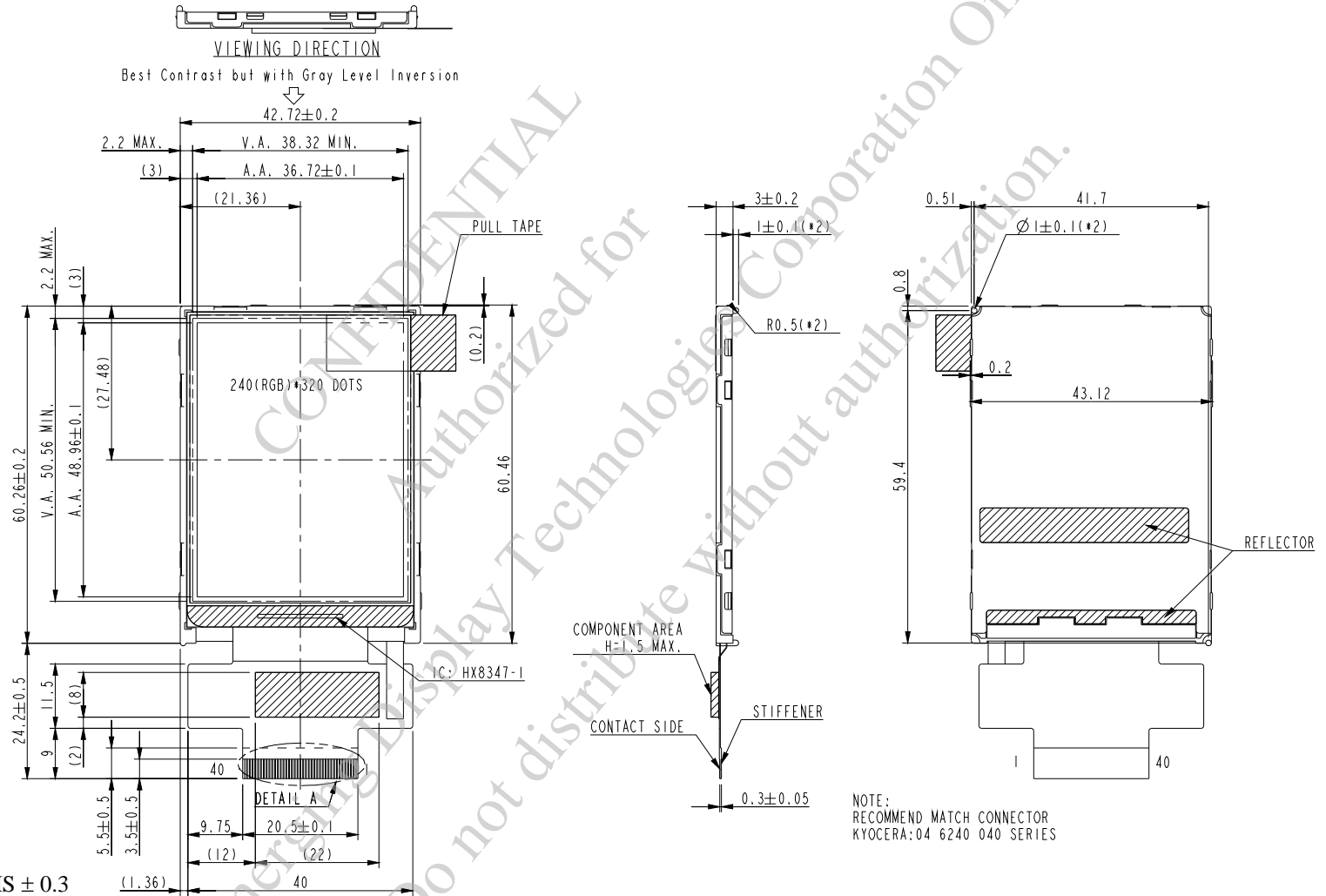
6.2 THE TEST METHOD OF BRIGHTNESS AND UNIFORMITY



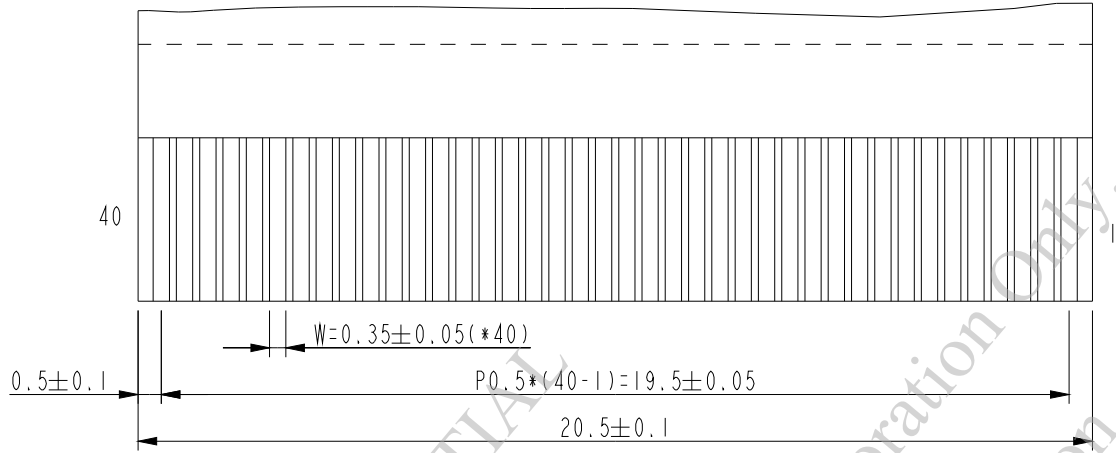
6.3 THE CALCULATING METHOD ON UNIFORMITY

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

7. OUTLINE DIMENSIONS



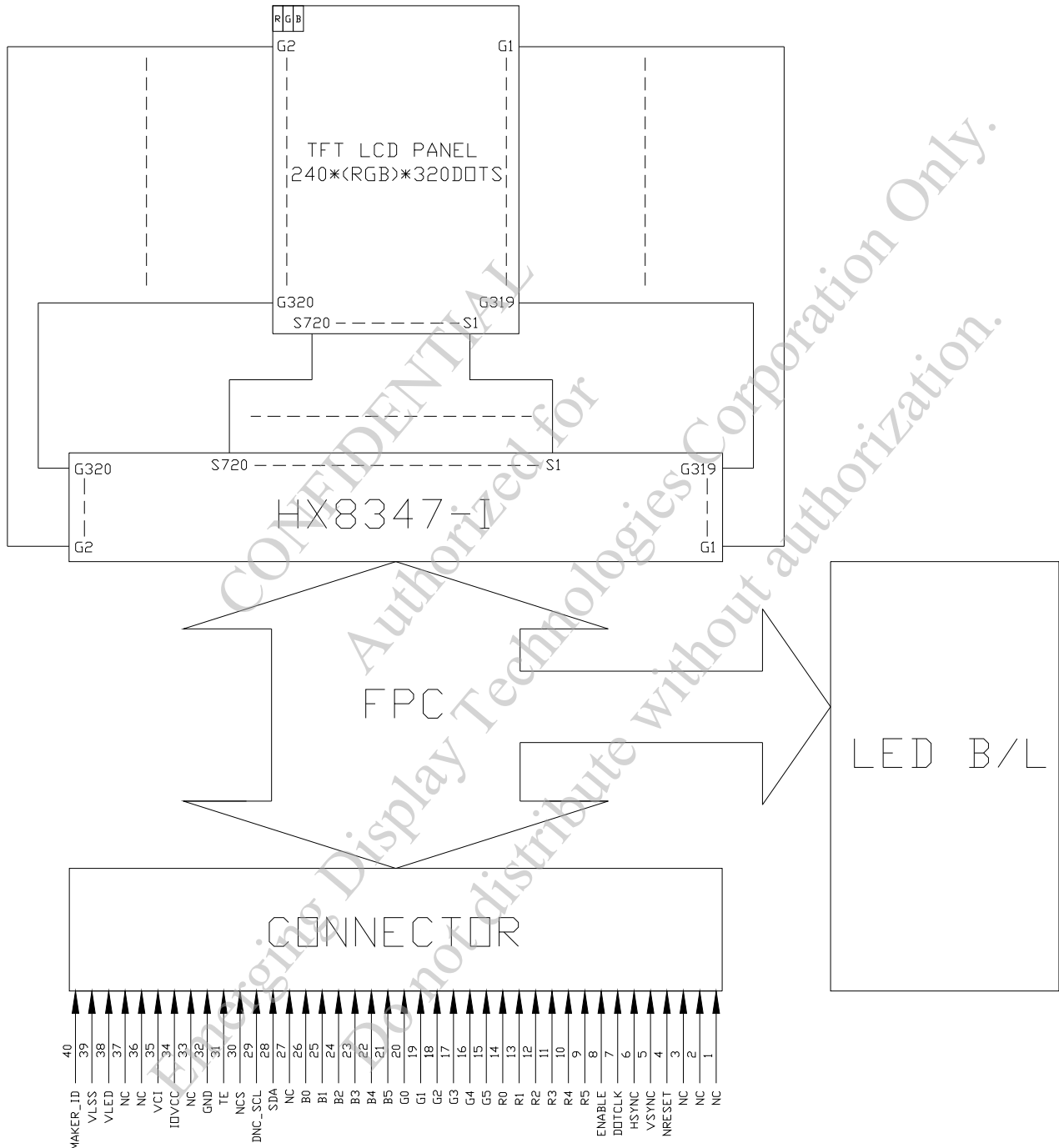
MODEL NO.	VERSION	PAGE
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DETAIL A
SCALE 5:1

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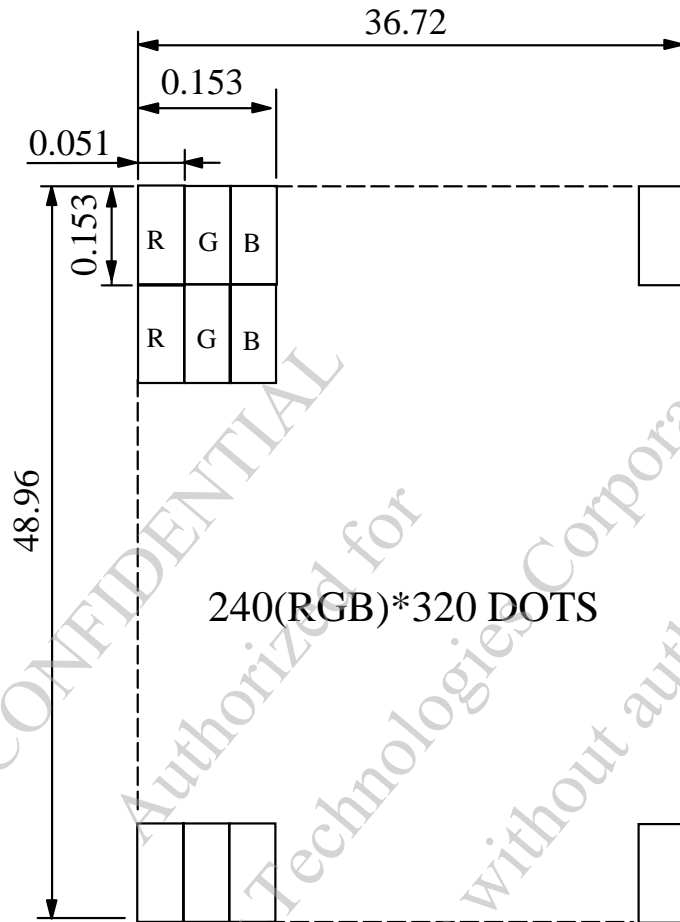
8. BLOCK DIMENSION



NOTE :

SUGGEST CUSTOMER TO ADD 220Ω RESISTORS IN SERIES WITH ALL RGB DATA AND 100Ω SERIES RESISTORS FOR ENABLE, H/V SYNC AND DOTCLK (EVENTUALLY WITH 100pF TO VSS EXCEPT FOR DOTCLK)

9. DETAIL DRAWING OF DOT MATRIX



240(RGB)*320 DOTS

UNIT : mm

SCALE : NTS

NOT SPECIFIED TOLERANCE IS ± 0.1

DOTS MATRIX TOLERANCE IS ± 0.01

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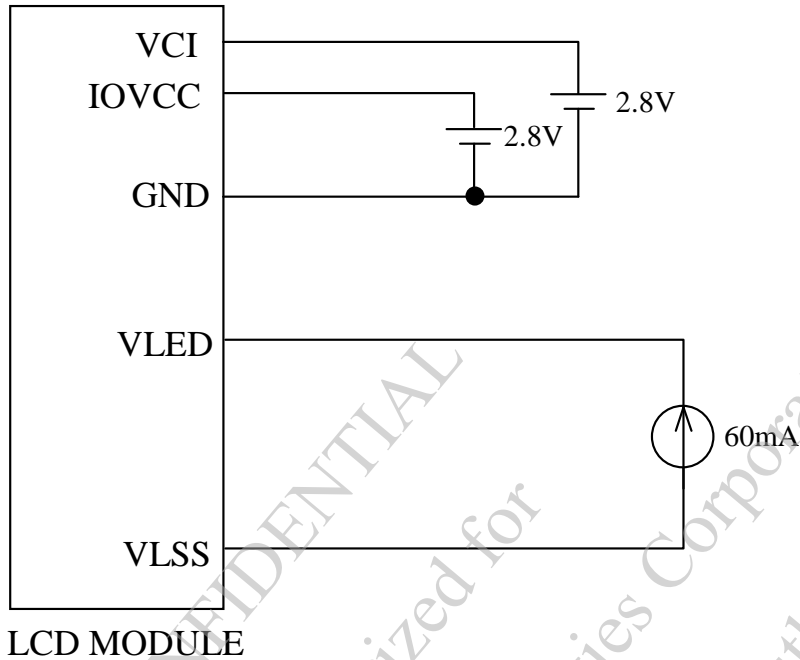
10. INTERFACE SIGNALS

10.1 LCD MODULE CONNECTOR INTERFACE

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	<p>DATA BUS</p> <p>16-BIT BUS : USE PIN 9-13, PIN 15-25 AND R0, B0 UNUSED</p> <p>18-BIT BUS : USE PIN 9-26</p> <p>CONNECTED UNUSED PINS TO THE GND LEVEL</p>
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	NC	NOT CONNECTION
28	SDA	SERIAL DATA INPUT PIN AND OUTPUT PIN IN SERIAL BUS SYSTEM INTERFACE
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	I0VCC	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	<p>MAKER IDENTIFICATION (MAY ESTABLISH "H", "L" OR "NC")</p> <p>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.</p> <p>NOTE : EDT MODULE'S SETTING IS "H".</p>

1.1. POWER SUPPLY

1.1.1. POWER SUPPLY FOR LCM



LCD MODULE

NOTE : $IOVCC \leq VCI$.

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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

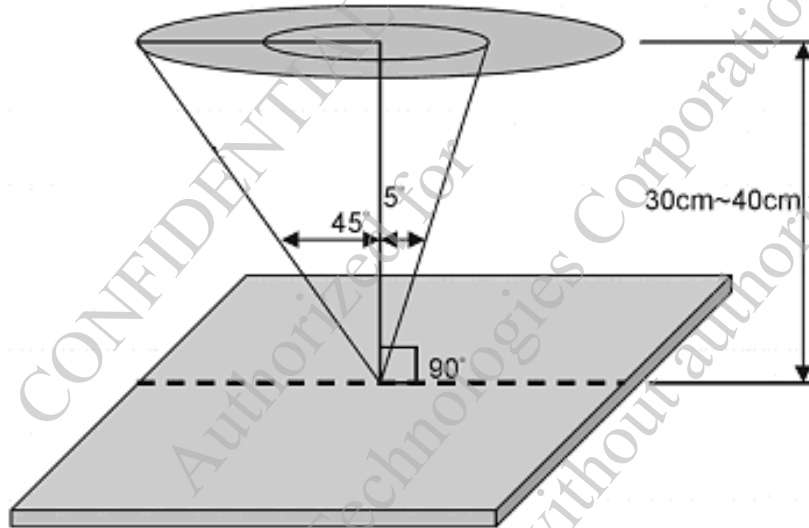
12.2 INSPECTION CONDITIONS

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

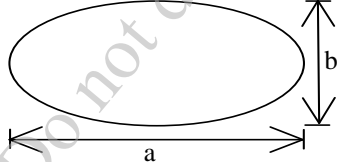
Minor defect : AQL 1.0

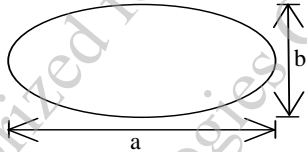
12.3 INSPECTION STANDARDS

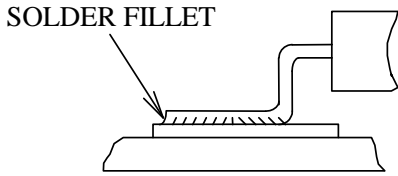
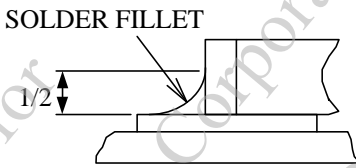
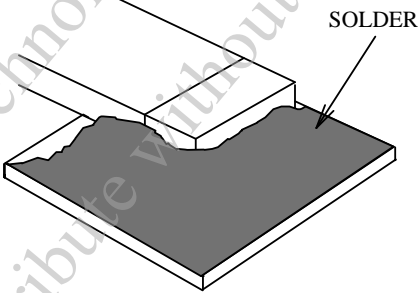
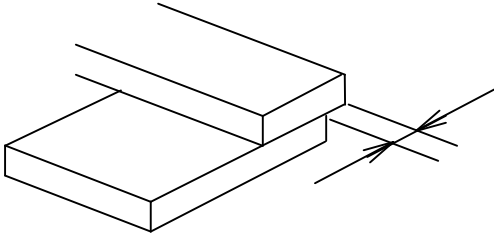
12.3.1 VISUAL DEFECTS CLASSIFICATION

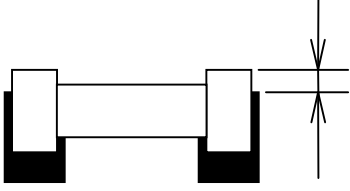
TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	<ul style="list-style-type: none"> • DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS EX: DISCONNECTION, SHORT CIRCUIT ETC 	0.65
	2.BACKLIGHT	<ul style="list-style-type: none"> • NO LIGHT • FLICKERING AND 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 • LEVER COLOR SPREED 	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 	

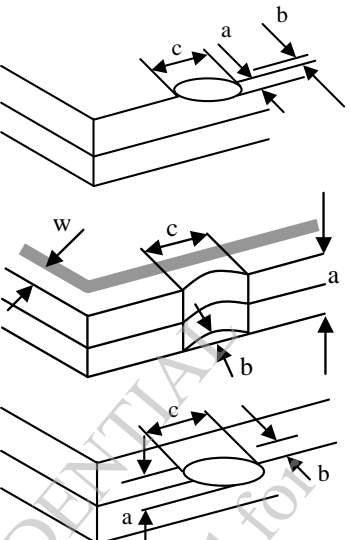
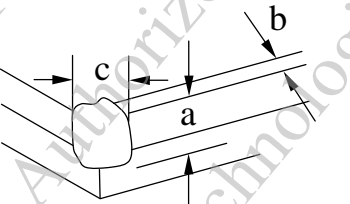
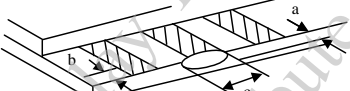
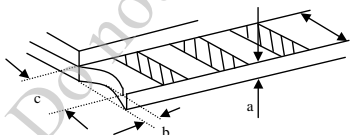
12.3.2 MODULE DEFECTS CALSSIFICATION

NO.	ITEM	CRITERIA												
1.	DISPLAY ON INSPECTION	(1)INCORRECT PATTERN (2)MISSING SEGMENT (3)DIM SEGMENT (4)OPERATING VOLTAGE BEYOND SPEC												
2.	OVERALL DIMENSIONS	(1)OVERALL DIMENSION BEYOND SPEC												
3.	DOT DEFECT	(1) INSPECTION PATTERN: FULL WHITE, FULL BLACK, RED, GREEN AND BLUE SCREENS. (2) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>ITEMS</th> <th>ACCEPTABLE COUNT</th> </tr> </thead> <tbody> <tr> <td>BRIGHT DOT</td> <td>$N \leq 1$</td> </tr> <tr> <td>DARK DOT</td> <td>$N \leq 3$</td> </tr> <tr> <td>TOAL BRIGHT AND DARK DOTS</td> <td>$N \leq 3$</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 DEFECTIUVE DOT.</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>	ITEMS	ACCEPTABLE COUNT	BRIGHT DOT	$N \leq 1$	DARK DOT	$N \leq 3$	TOAL BRIGHT AND DARK DOTS	$N \leq 3$				
ITEMS	ACCEPTABLE COUNT													
BRIGHT DOT	$N \leq 1$													
DARK DOT	$N \leq 3$													
TOAL BRIGHT AND DARK DOTS	$N \leq 3$													
4.	FOREIGN BLACK/WHITE/ BRIGHT LINE/ SCRATCH OF VIEWING AREA	<table border="1" style="margin-left: 20px;"> <thead> <tr> <th>LENGTH : L</th> <th>WIDTH : W</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>$L \leq 0.3$</td> <td>$W \leq 0.05$</td> <td>IGNORE</td> </tr> <tr> <td>$0.3 < L \leq 2$</td> <td>$0.05 < W \leq 0.1$</td> <td>3</td> </tr> <tr> <td>$2 < L$</td> <td>$0.1 < W$</td> <td>NONE</td> </tr> </tbody> </table> <p>WIDTH : W mm, LENGH : L mm</p>	LENGTH : L	WIDTH : W	PERMISSIBLE NO.	$L \leq 0.3$	$W \leq 0.05$	IGNORE	$0.3 < L \leq 2$	$0.05 < W \leq 0.1$	3	$2 < L$	$0.1 < W$	NONE
LENGTH : L	WIDTH : W	PERMISSIBLE NO.												
$L \leq 0.3$	$W \leq 0.05$	IGNORE												
$0.3 < L \leq 2$	$0.05 < W \leq 0.1$	3												
$2 < L$	$0.1 < W$	NONE												
5.	FOREIGN MATTER \ BLACK SPOTS \ WHITE SPOTS \ DENT (INCLUDING LIGHT LEAKAGE DUE TO POLARIZING PLATES PINHOLES, ETC.)	<table border="1" style="margin-left: 20px;"> <thead> <tr> <th>AVERAGE DIAMETER (mm): D</th> <th>NUMBER OF PIECES PERMITTED</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.1$</td> <td>IGNORE</td> </tr> <tr> <td>$0.1 < D \leq 0.3$</td> <td>3</td> </tr> <tr> <td>$0.3 < D$</td> <td>NONE</td> </tr> </tbody> </table> <p>NOTE : DIAMETER $D=(a+b)/2$</p> 	AVERAGE DIAMETER (mm): D	NUMBER OF PIECES PERMITTED	$D \leq 0.1$	IGNORE	$0.1 < D \leq 0.3$	3	$0.3 < D$	NONE				
AVERAGE DIAMETER (mm): D	NUMBER OF PIECES PERMITTED													
$D \leq 0.1$	IGNORE													
$0.1 < D \leq 0.3$	3													
$0.3 < D$	NONE													

NO.	ITEM	CRITERIA		
			AVERAGE DIAMETER (mm) : D	NUMBER OF PIECES PERMITTED
6.	BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS	BUBBLE ON THE POLARIZER	$D \leq 0.25$	IGNORE
			$0.25 < D \leq 0.5$	$N \leq 5$
			$0.5 < D$	NOTE
		SURFACE STATUS	$D < 0.1 \text{ mm}$	IGNORE
			$0.1 < D \leq 0.3\text{mm}$	$N \leq 3$
		CF FAIL / SPOT	$D < 0.1 \text{ mm}$	IGNORE
$0.1 < D \leq 0.3\text{mm}$	$N \leq 3$			
		<p>NOTE : (1)POLARIZER BUBBLE IS DEFINED AS THE BUBBLE APPEARS ON ACTIVE DISPLAY AREA. THE DEFECT OF POLARIZER BUBBLE SHALL BE IGNORED IF THE POLARIZER BUBBLE APPEARS ON THE OUTSIDE OF ACTIVE DISPLAY AREA.</p> <p>(2)THE EXTRANEIOUS SUBSTANCE IS DEFINED AS IT CAN BE OBSERVED WHEN THE MODULE IS POWER ON.</p> <p>(3)THE DEFINITION OF AVERAGE DIAMETER, D IS DEFINED AS FOLLOWING.</p> <p>AVERAGE DIAMETER (D)=(a+b)/2</p> 		
7.	LINE DEFECT ON DISPLAY	OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOW		
8.	MURA ON DISPLAY	IT'S OK IF MURA IS SLIGHT VISIBLE THROUG 6% ND FILTER		
9.	UNEVEN COLOR SPREAD, COLORATION	(1)TO BE DETERMINED BASED UPON THE STANDARD SAMPLE.		
10.	BEZEL APPEARANCE	(1)BEZEL MAY NOT HAVE RUST, BE DEFORMED OR HAVE FINGER PRINTS STAINS OF OTHER CONTAMINATION. (2)BEZEL MUST COMPLY WITH JOB SPECIFICATIONS.		
11	PCB	<p>(1)THERE MAY NOT BE MORE THAN 2mm OF SEALANT OUTSIDE THE SEAL AREA ON THE PCB, AND THERE SHOULD BE NO MORE THAN THREE PLACES.</p> <p>(2)NO OXIDATION OR CONTAMINATION PCB TERMINALS</p> <p>(3)PARTS ON PCB MUST BE THE SAME AS ON THE PRODUCTION CHARACTERISTIC CHART. THERE SHOULD BE NO WRONG PARTS, MISSING PARTS OR EXCESS PARTS.</p> <p>(4)THE JUMPER ON THE PCB SHOULD CONFORM TO THE PRODUCT CHARACTERISTIC CHART.</p> <p>(5)IF SOLDER GETS ON BEZEL TAB PADS, LED PAD, ZEBRA PAD OR SCREW HOLD PAD; MAKE SURE IT IS SMOOTHED DOWN.</p>		

NO.	ITEM	CRITERIA
12.	SOLDERING	<p>(1)NO SOLDERING FOUND ON THE SPECIFIED PLACE</p> <p>(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 ALIGMENT</p> <p>(a)LSI, IC LEAD WIDTH IS MORE THAN 50% BEYOND PAD OUTLINE</p> 

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

NO.	ITEM	CRITERIA									
15.	CRACKED GLASS	<p>THE LCD WITH EXTENSIVE CRACK IS NOT ACCEPTABLE</p> <p>GENERAL GLASS CHIP :</p>  <table border="1" data-bbox="933 414 1455 504"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>$\leq t/2$</td> <td>< VIEWING AREA</td> <td>$\leq 1/8X$</td> </tr> <tr> <td>$t/2 > , \leq 2t$</td> <td>$\leq W/2$</td> <td>$\leq 1/8X$</td> </tr> </tbody> </table> <p>*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE X = LCD SIDE LENGTH t = GLASS THICKNESS</p>	a	b	c	$\leq t/2$	< VIEWING AREA	$\leq 1/8X$	$t/2 > , \leq 2t$	$\leq W/2$	$\leq 1/8X$
		a	b	c							
		$\leq t/2$	< VIEWING AREA	$\leq 1/8X$							
		$t/2 > , \leq 2t$	$\leq W/2$	$\leq 1/8X$							
<p>CORNER PART :</p>  <table border="1" data-bbox="933 1003 1455 1093"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>$\leq t/2$</td> <td>< VIEWING AREA</td> <td>$\leq 1/8X$</td> </tr> <tr> <td>$> t/2 , \leq 2t$</td> <td>$\leq W/2$</td> <td>$\leq 1/8X$</td> </tr> </tbody> </table> <p>*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE X = LCD SIDE LENGTH t = GLASS THICKNESS</p>	a	b	c	$\leq t/2$	< VIEWING AREA	$\leq 1/8X$	$> t/2 , \leq 2t$	$\leq W/2$	$\leq 1/8X$		
a	b	c									
$\leq t/2$	< VIEWING AREA	$\leq 1/8X$									
$> t/2 , \leq 2t$	$\leq W/2$	$\leq 1/8X$									
<p>CHIP ON ELECTRODE PAD</p>  <table border="1" data-bbox="933 1276 1455 1332"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>$\leq t$</td> <td>$\leq 0.5\text{mm}$</td> <td>$\leq 1/8X$</td> </tr> </tbody> </table> <p>* X=LCD SIDE WIDTH t=GLASS THICKNESS</p>	a	b	c	$\leq t$	$\leq 0.5\text{mm}$	$\leq 1/8X$					
a	b	c									
$\leq t$	$\leq 0.5\text{mm}$	$\leq 1/8X$									
 <table border="1" data-bbox="933 1433 1455 1489"> <thead> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>$\leq t$</td> <td>$\leq 1/8X$</td> <td>$\leq L$</td> </tr> </tbody> </table> <p>*X=LCD SIDE WIDTH t = GLASS THICKNESS L=ELECTRODE PAD LENGTH ①IF GLASS CHIPPING THE ITO TERMINAL, OVER 2/3 OF THE ITO MUST REMAIN AND BE, INSPECTED ACCORDING TO ELECTRODE TERMINAL SPECIFICATIONS ②IF THE PRODUCT WILL BE HEAT SEALED BY THE CUSTOMER, THE ALIGNMENT MARK MUST NOT BE DAMAGED</p>	a	b	c	$\leq t$	$\leq 1/8X$	$\leq L$					
a	b	c									
$\leq t$	$\leq 1/8X$	$\leq L$									

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 TEMPERATURE / HIGH HUMIDITY 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)	AIR DISCHARGE ± 12KV CONTACT DISCHARGE ± 8KV ACCORDING TO IEC-61000-4-2

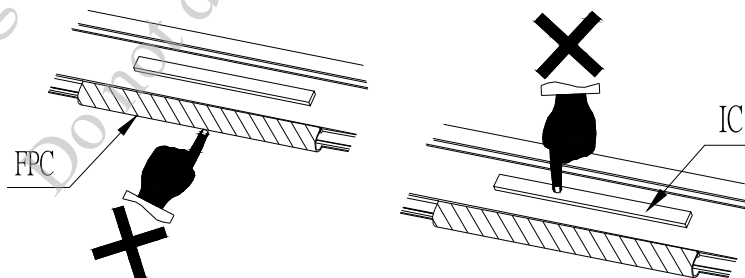
12.4.2 TESTING CONDITIONS AND INSPECTION CRITERIA

FOR THE FINAL TEST THE TESTING SAMPLE MUST BE STORED AT ROOM TEMPERATURE FOR 24 HOURS, 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 OPERATION

- 12.5.1 Do not connect or disconnect modules to or from the main system while power is being supplied .
- 12.5.2 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 .
- 12.5.3 Adjust the LC driving voltage to obtain the optimum contrast .
- 12.5.4 Power On Sequence input signals should not be supplied to LCD module before power supply voltage is applied and reaches the specified value (5 \pm 0.25v) .
If above sequence is not followed , CMOS LSIs of LCD modules may be damaged due to latch - up problem .
- 12.5.5 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!



12.6 NOTICE

- 12.6.1 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 .
- 12.6.2 Do not disassemble . EDT shall not be held responsible if the module is disassembled and upon the reassembly the module failed .
- 12.6.3 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 .
- 12.6.4 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 .
- 12.6.5 Don't give external shock.
- 12.6.6 Don't apply excessive force on the surface.
- 12.6.7 Liquid in LCD is hazardous substance. Must not lick and swallow. When the liquid is attached to your, skin, cloth etc. washes it out thoroughly and immediately.
- 12.6.8 Don't operate it above the absolute maximum rating.
- 12.6.9 Storage in a clean environment, free from dust, active gas, and solvent.
- 12.6.10 Store without any physical load.
- 12.6.11 Rewiring : no more than 3 times .

Emerging Display Technologies Corporation
Do not distribute without authorization.