EXAMINED BY : Vincent Wu	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-0006808
		ISSUE : APR.02, 2013
APPROVED BY: David Chang		TOTAL PAGE : 30
		VERSION : 9

CUSTOMER ACCEPTANCE SPECIFICATIONS

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MODEL NO. :

ET0430G0DH6

(GP)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

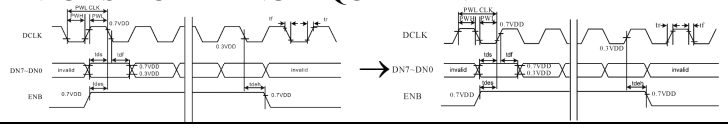
BY :

_____

RECORDS OF REVISION

DOC . FIRST ISSUE

JAN.23, 2009

DATE	REVISED PAGE NO.	SUMMARY
FEB.16, 2009	6	5.2 INPUT SETUP TIMING REQUIREMENT 
	14	ADD 11.2 THE BRIGHTNESS CONTROLLED BY BACKLIGHT CURRENT OF LEDCTRL.
MAR.09, 2009	3	4. ELECTRICAL CHARACTERISTIC POWER SUPPLY CURRENT FOR LED DRIVER : TYP.= (50) → (390), MAX.= (70) → (510)
	9	7. OUTLINE DIMENSIONS MARK △1 : CHANGE CONNECTOR & MODIFY DIMENSION
	10	8. BLOCK DIAGRAM ADD FRAME GROUND
APR.07, 2009	9	7. OUTLINE DIMENSIONS MARK △2 : MODIFY CN1 TYPE
SEP.02,2009	3	4. ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	(15)	(20)	mA	NOTE (2)
POWER SUPPLY CURRENT FOR LED DRIVER	ICC	VCC-VSS=3.3V LED B/L-ON	—	(390)	(510)	mA	
POWER SUPPLY FOR LED BACKLIGHT	V_{BL+} - V_{BL-}	IF = 36mA	(17.4)	(19.8)	(21.6)	V	NOTE (3)
LED LIFE TIME			(30K)	(40K)	—	HRS	

↓

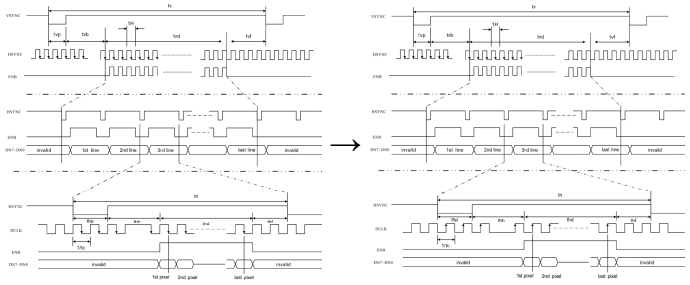
PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	15	20	mA	NOTE (2)
POWER SUPPLY CURRENT FOR LED DRIVER	ICC	VCC-VSS=3.3V LED B/L-ON	—	390	510	mA	
POWER SUPPLY FOR LED BACKLIGHT	V_{BL+} - V_{BL-}	IF = 36mA	17.4	19.8	21.6	V	NOTE (3)
LED LIFE TIME	—	—	30K	40K	—	HRS	

	7	6.1 OPTICAL CHARACTERISTICS

ITEM		MIN.	TYP.	MAX.
VIEWING ANGLE		(40)	(45)	—
		(70)	(75)	—
		(70)	(75)	—
		(70)	(75)	—
CONTRAST RATIO		(300)	—	—
RESPONSE TIME		—	(5)	—
		—	(15)	—
COLOR OF CIE COORDINATE	WHITE	(0.26)	(0.31)	(0.36)
		(0.29)	(0.34)	(0.39)
	RED	(0.56)	(0.61)	(0.66)
		(0.30)	(0.35)	(0.40)
	GREEN	(0.29)	(0.34)	(0.39)
		(0.53)	(0.58)	(0.63)
	BLUE	(0.09)	(0.14)	(0.19)
		(0.05)	(0.10)	(0.15)
THE BRIGHTNESS OF MODULE		(350)	—	—
THE UNIFORMITY OF MODULE		(70)	(75)	—

→

ITEM		MIN.	TYP.	MAX.
VIEWING ANGLE		56	63	—
		68	75	—
		68	75	—
		68	75	—
CONTRAST RATIO		300	—	—
RESPONSE TIME		—	5	—
		—	15	—
COLOR OF CIE COORDINATE	WHITE	0.26	0.31	0.36
		0.28	0.33	0.38
	RED	0.55	0.60	0.65
		0.28	0.33	0.38
	GREEN	0.28	0.33	0.38
		0.49	0.54	0.59
	BLUE	0.09	0.14	0.19
		0.04	0.09	0.14
THE BRIGHTNESS OF MODULE		350	—	—
THE UNIFORMITY OF MODULE		70	75	—

	9	7. OUTLINE DIMENSIONS MARK △3 : MODIFY CN2 TYPE.
FEB.24, 2010	3	4. ELECTRICAL CHARACTERISTICS POWER SUPPLY VOLTAGE FOR LED DRIVER：MAX.=3.6 → 5.5
MAR.22,2010	7	6.1 OPTICAL CHARACTERISTICS CONTRAST RATIO : TYP. = — → 450 THE BRIGHTNESS OF MODULE : TYP. = — → 385
MAR.01 , 2012	5	5.1 PARALLEL RGB INPUT TIMING REQUIREMENT 

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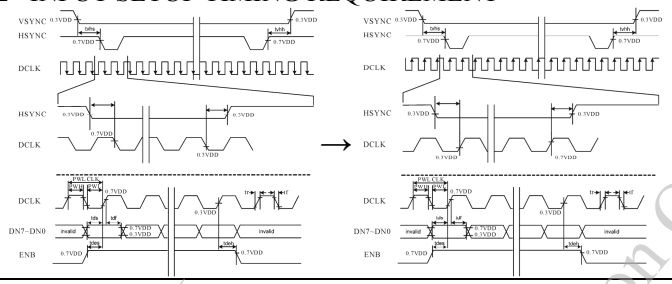
DOC . FIRST ISSUE

JAN.23, 2009

DATE	REVISED PAGE NO.	SUMMARY
MAR.01 , 2012	6	5.2 INPUT SETUP TIMING REQUIREMENT 
	8	6.1 OPTICAL CHARACTERISTICS NOTE (2) : DEFINITION OF VIEWING ANGLE : 12o'clock direction θy- = 90° → θy+ = 90° NOTE (4) : DEFINITION OF RESPONSE TIME : TR AND TF →T_R AND T_F
APR.02, 2013	2	3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS ITEM / OPERATING (MIN. -10°C, MAX. 60°C) / STORAGE (MIN. -20°C, MAX. 70°C) / REMARK: NOTE (1) , (2) ↓ ITEM / OPERATING (MIN. -20°C, MAX. 70°C) / STORAGE (MIN. -30°C, MAX. 80°C) / REMARK: NOTE (1) , (2) NOTE (1) : Ta AT -20°C → -30°C, 70°C → 80°C.
	28	13.4.1 STANDARD SPECIFICATIONS FOR RELIABILITY OF LCD MODULE NO.1：+60°C→+70°C, NO.2：-10°C→-20°C, NO.3：+70°C→+80°C, NO.4：-20°C→-30°C

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1. GENERAL SPECIFICATIONS

1.1 APPLICATION NOTES FOR CONTROLLER/DRIVER
PLEASE REFER TO：

HIMAX HX8257-A

1.2 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) DIAGONALS	----------	4.3 inch
(2) NUMBER OF DOTS	----------	480W * (RGB) * 272H DOTS
(3) MODULE SIZE	----------	105.5W * 67.2H *9.3D(MAX.) mm (WITHOUT FPC)
(4) EFFECTIVE AREA	----------	98.7W * 56.4H mm
(5) ACTIVE AREA	----------	95.04W * 53.856H mm (LCD) 97W * 55.8H mm (T/P)
(6) DOT SIZE	----------	0.066W * 0.198H mm
(7) PIXEL SIZE	----------	0.198W * 0.198H mm
(8) LCD TYPE	----------	TFT , TRANSMISSIVE
(9) COLOR	----------	262K
(10) VIEWING DIRECTION	----------	6 O'CLOCK
(11) BACK LIGHT	----------	LED , COLOR : WHITE
(12) INTERFACE MODE	----------	RGB(18 BIT) PARALLEL

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3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	-0.3	4.0	V	
STATIC ELECTRICITY	—	—	—	V	NOTE (1)
LED BACKLIGHT POWER DISSIPATION	PD	—	1.3	W	
LED BACKLIGHT FORWARD CURRENT	IF	—	60	mA	

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

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	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	—	3.92 m/s^2 (0.4 G)		19.6 m/s^2 (2.0 G)	10~55Hz X, Y, Z, EACH 2HRS
SHOCK	—	58.8 m/s^2 (6 G)	—	980 m/s^2 (100 G)	6 m SECONDS XYZ DIRECTIONS 3 TIMES 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).

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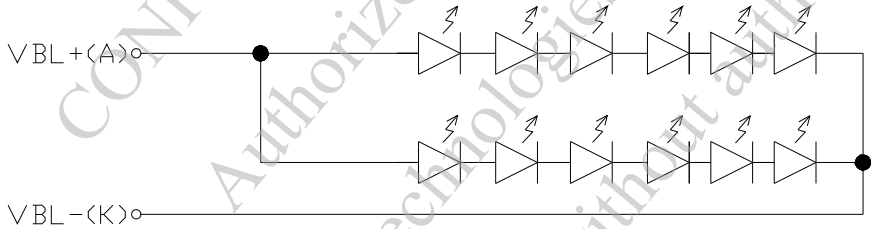
4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C

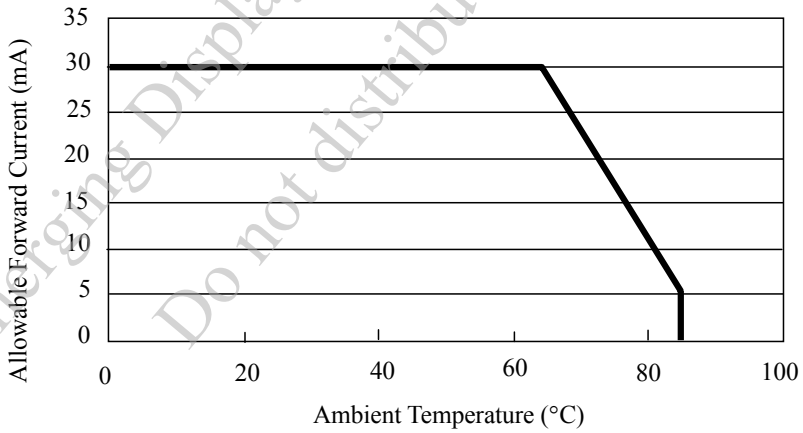
PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3	3.3	3.6	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VCC-VSS	—	2.7	3.3	5.5	V	
LOGIC HIGH INPUT VOLTAGE	VIH	—	0.7*VDD	—	VDD	V	NOTE (1)
LOGIC LOW INPUT VOLTAGE	VIL	—	0	—	0.3*VDD	V	
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	15	20	mA	NOTE (2)
POWER SUPPLY CURRENT FOR LED DRIVER	ICC	VCC-VSS=3.3V LED B/L=ON	—	390	510	mA	
POWER SUPPLY FOR LED BACKLIGHT	$V_{BL}+-V_{BL}-$	IF = 36mA	17.4	19.8	21.6	V	NOTE (3)
LED LIFE TIME	—	—	30K	40K	—	HRS	

NOTE (1) : APPLIED TO TERMINALS 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



12 LED CHIPS

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



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5 . TIMING CHARACTERISTICS

THE HX8257-A BOTH SUPPORTS DE MODE AND SYNC MODE TIMING. THE MODE WAS DECIDED BY DE SIGNAL INTERNALLY. WHEN DE IS PULLED LOW, THE HX8257-A USES HS+VS FOR TIMING CONTROL AND THIS TIMING MODE IS SYNC MODE. WHEN DE IS PULLED HIGH FOR ACTIVE DATA AND PULLED LOW FOR BLANKING DATA, THE HX8257-A USES DE FOR TIMING CONTROL AND THIS TIMING MODE IS DE MODE. THE DETAIL TIMING CHART SHOWED BELOW.

5.1 PARALLEL RGB INPUT TIMING REQUIREMENT

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLOCK CYCLE	f_{CLK}(1)	—	9	15	MHz
HSYNC CYCLE	1/th	—	17.14	—	KHz
VSYNC CYCLE	1/tv	—	59.94	—	Hz
HORIZONTAL SIGNAL					
HORIZONTAL CYCLE	th	525	525	605	CLK
HORIZONTAL DISPLAY PERIOD	thd	480	480	480	CLK
HORIZONTAL FRONT PORCH	thf	2	2	82	CLK
HORIZONTAL PULSE WIDTH	thp(2)	2	41	41	CLK
HORIZONTAL BACK PORCH	thb(2)	2	2	41	CLK
VERTICAL SIGNAL					
VERTICAL CYCLE	tv	285	286	399	H(1)
VERTICAL DISPLAY PERIOD	tvd	272	272	272	H(1)
VERTICAL FRONT PORCH	tvf	1	2	227	H(1)
VERTICAL PULSE WIDTH	tvp(2)	1	10	11	H(1)
VERTICAL BACK PORCH	tvb(2)	1	2	11	H(1)

NOTE：1.UNIT: CLK=1/ f_{CLK} , H=th,

2. IT IS NECESSARY TO KEEP tvp+tvb=12 AND thp+thb=43 IN SYNC MODE. DE MODE IS UNNECESSARY TO KEEP IT.

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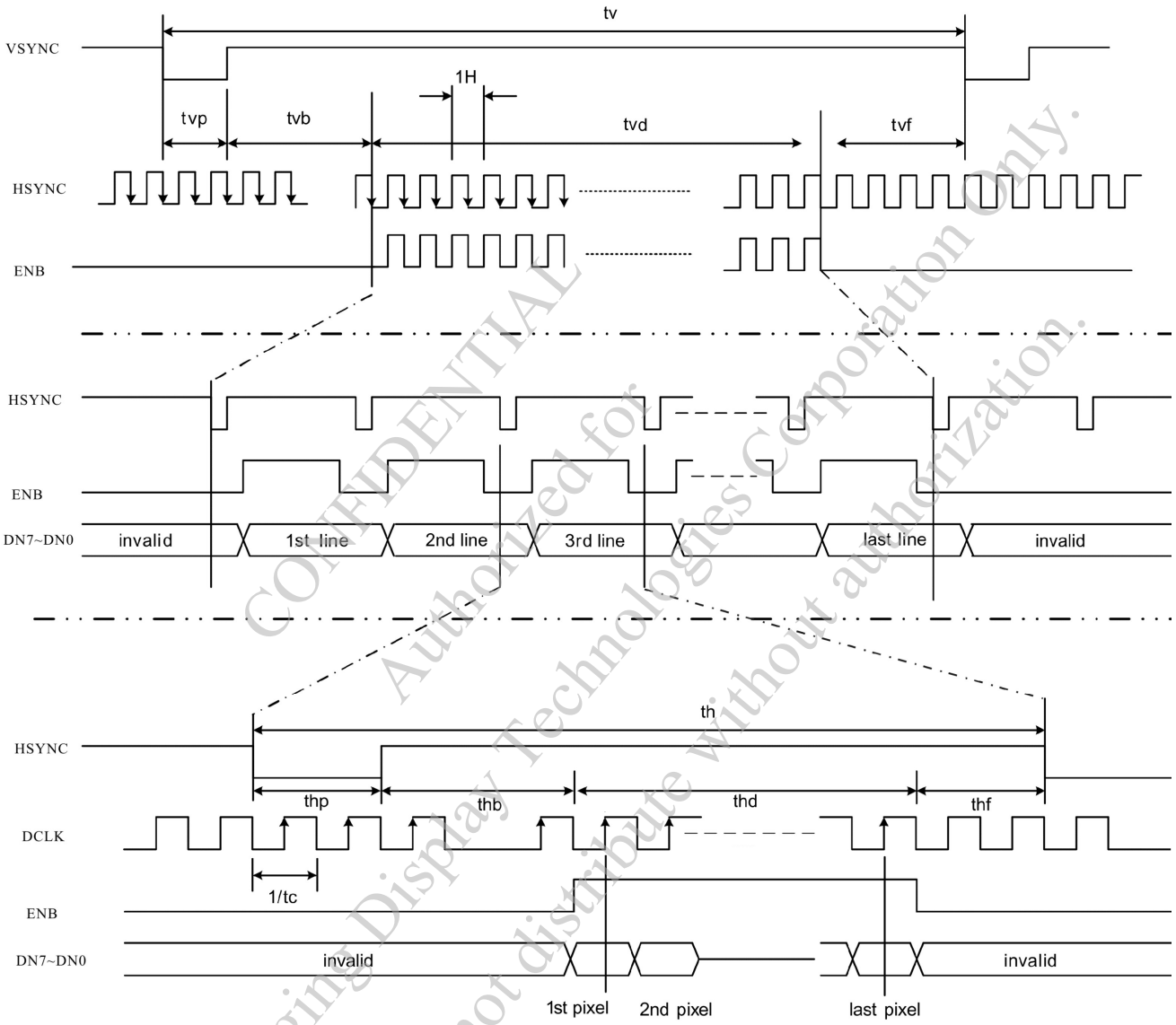

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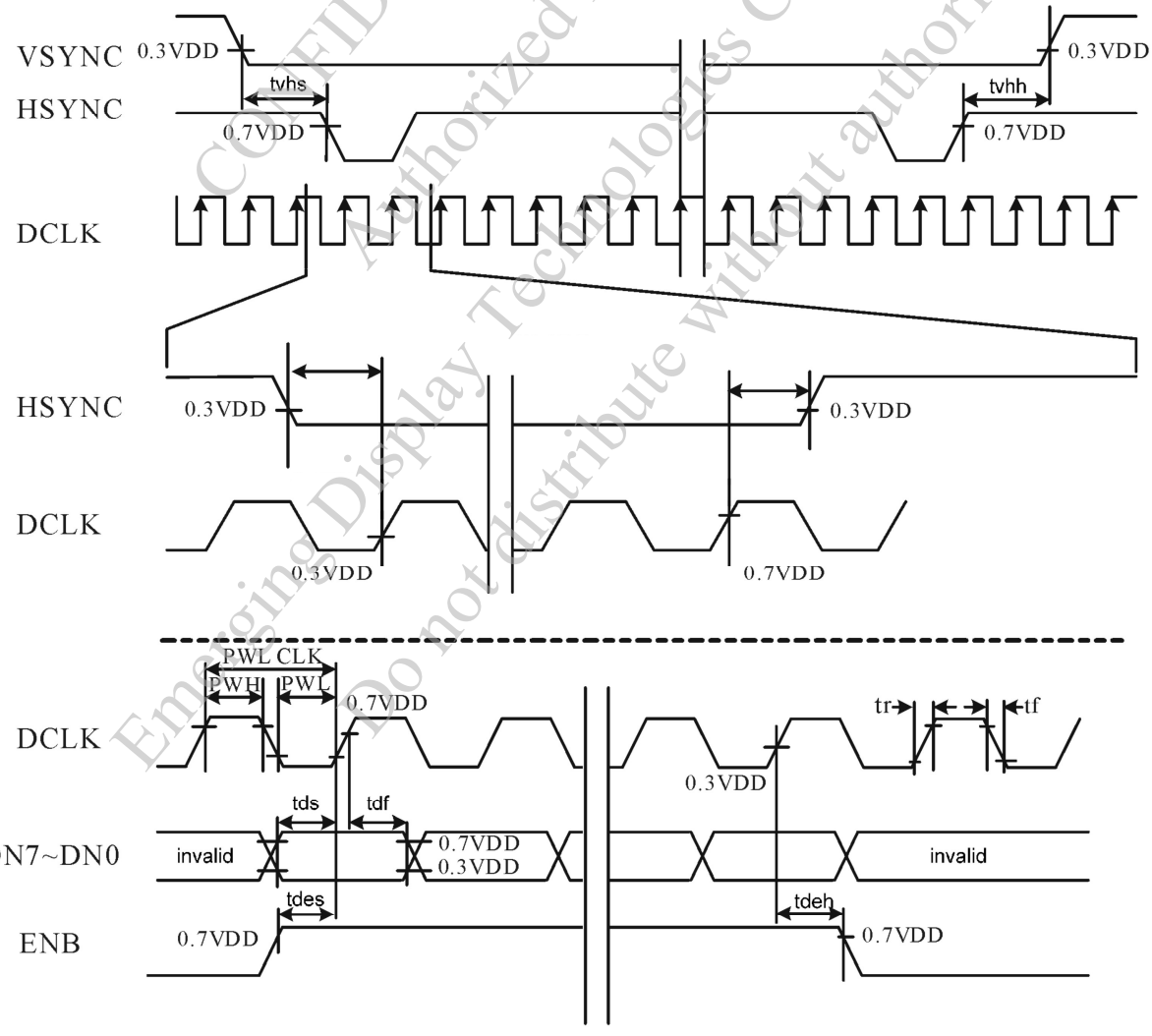
5.2 INPUT SETUP TIMING REQUIREMENT

($tr^{(1)} = tf^{(1)} = 2ns$)

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLOCK PERIOD	PW_{CLK} (2)	66.7	—	—	ns
CLOCK PULSE HIGH PERIOD	PWH (2)	26.7	—	—	ns
CLOCK PULSE LOW PERIOD	PWL (2)	26.7	—	—	ns
HSYNC SETUP TIME	t_{hs}	10	—	—	ns
HSYNC HOLD TIME	t_{hh}	10	—	—	ns
DATA SETUP TIME	t_{ds}	10	—	—	ns
DATA HOLD TIME	t_{dh}	10	—	—	ns
ENB SETUP TIME	t_{des}	10	—	—	ns
ENB HOLD TIME	t_{deh}	10	—	—	ns
VSYNC SETUP TIME	t_{vhs}	10	—	—	ns
VSYNC HOLD TIME	t_{vhh}	10	—	—	ns

NOTE : 1. tr, tf IS DEFINED 10% TO 90% OF SIGNAL AMPLITUDE.
2. FOR PARALLEL INTERFACE, MAXIMUM CLOCK FREQUENCY IS 15MHz.



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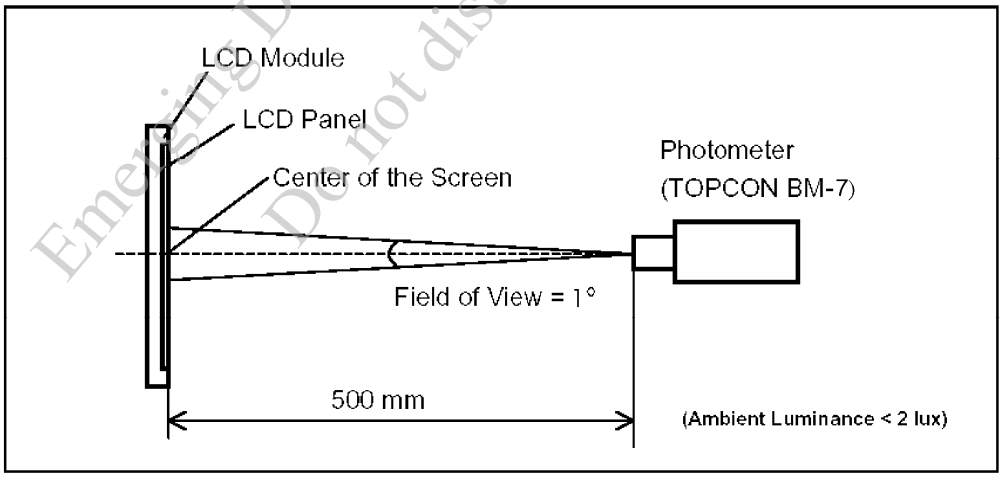
6. OPTICAL CHARACTERISTICS (NOTE 1)

6.1 OPTICAL CHARACTERISTICS

Ta = 2 5°C

ITEM		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	REMARK
VIEWING ANGLE		θ_{y+}	CR ≥ 10	θ_x=0°	56	63	—	deg.	NOTE (2) NOTE (3)
		θ_{y-}			68	75	—		
		θ_{x+}		θ_y=0°	68	75	—		
		θ_{x-}			68	75	—		
CONTRAST RATIO		CR	θx=0° , θy=0°		300	450	—	—	NOTE (3)
RESPONSE TIME		T_R (rise)	θx=0° , θy=0°		—	5	—	msec	NOTE (4)
		T_F (fall)			—	15	—		
COLOR OF CIE COORDINATE	WHITE	Wx	θx=0° , θy=0° IF = 36mA (NTSC : 55%)		0.26	0.31	0.36	—	NOTE (5)
		Wy			0.28	0.33	0.38		
	RED	Rx			0.55	0.60	0.65	—	
		Ry			0.28	0.33	0.38		
	GREEN	Gx			0.28	0.33	0.38	—	
		Gy			0.49	0.54	0.59		
	BLUE	Bx			0.09	0.14	0.19	—	
		By			0.04	0.09	0.14		
THE BRIGHTNESS OF MODULE		B	θx=0° , θy=0° IF = 36mA		350	385	—	cd/m²	NOTE (6)
THE UNIFORMITY OF MODULE		—			70	75	—	%	

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.



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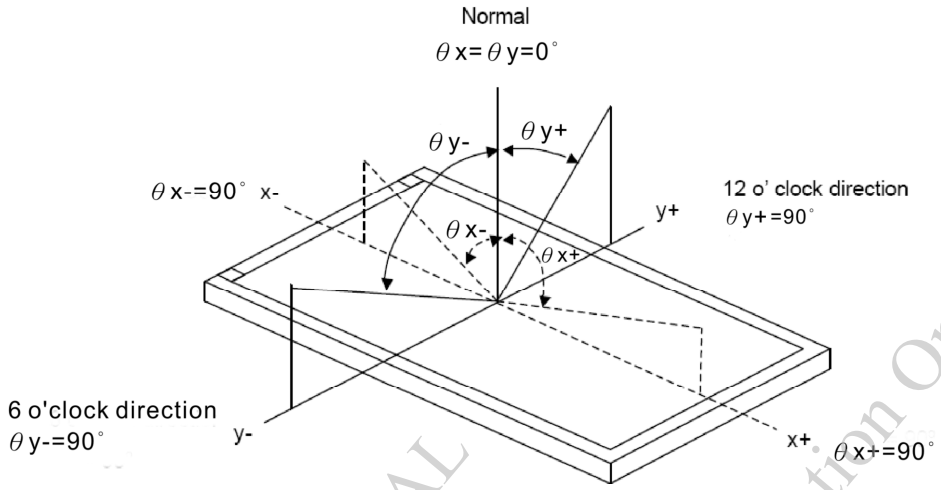
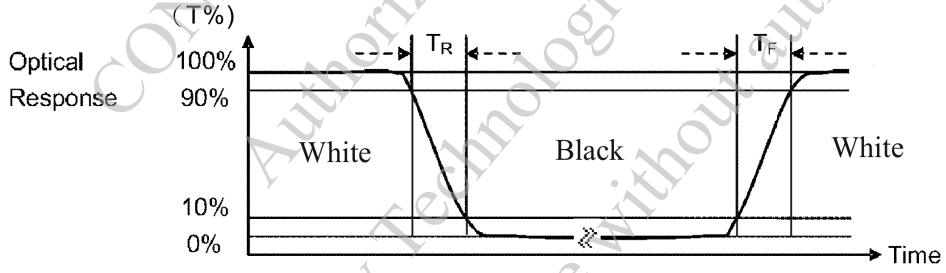
NOTE (2) : DEFINITION OF VIEWING ANGLE :



NOTE (3) : DEFINITION OF CONTRAST RATIO :

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

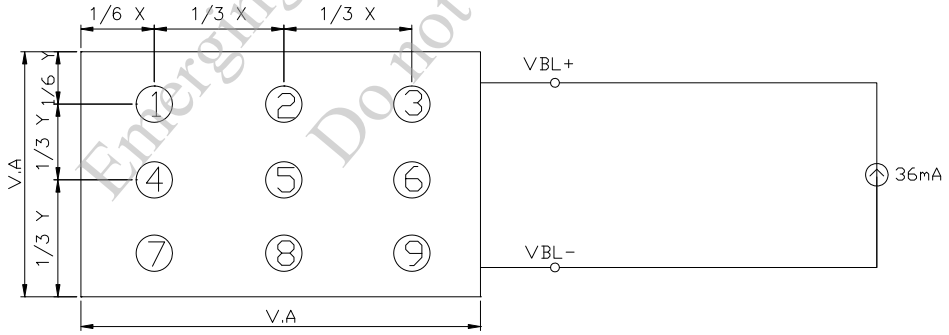
NOTE (4) : DEFINITION OF RESPONSE TIME : T_R AND T_F
THE FIGURE BELOW IS THE OUTPUT SIGNAL OF THE PHOTO DETECTOR.



NOTE (5) : 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

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

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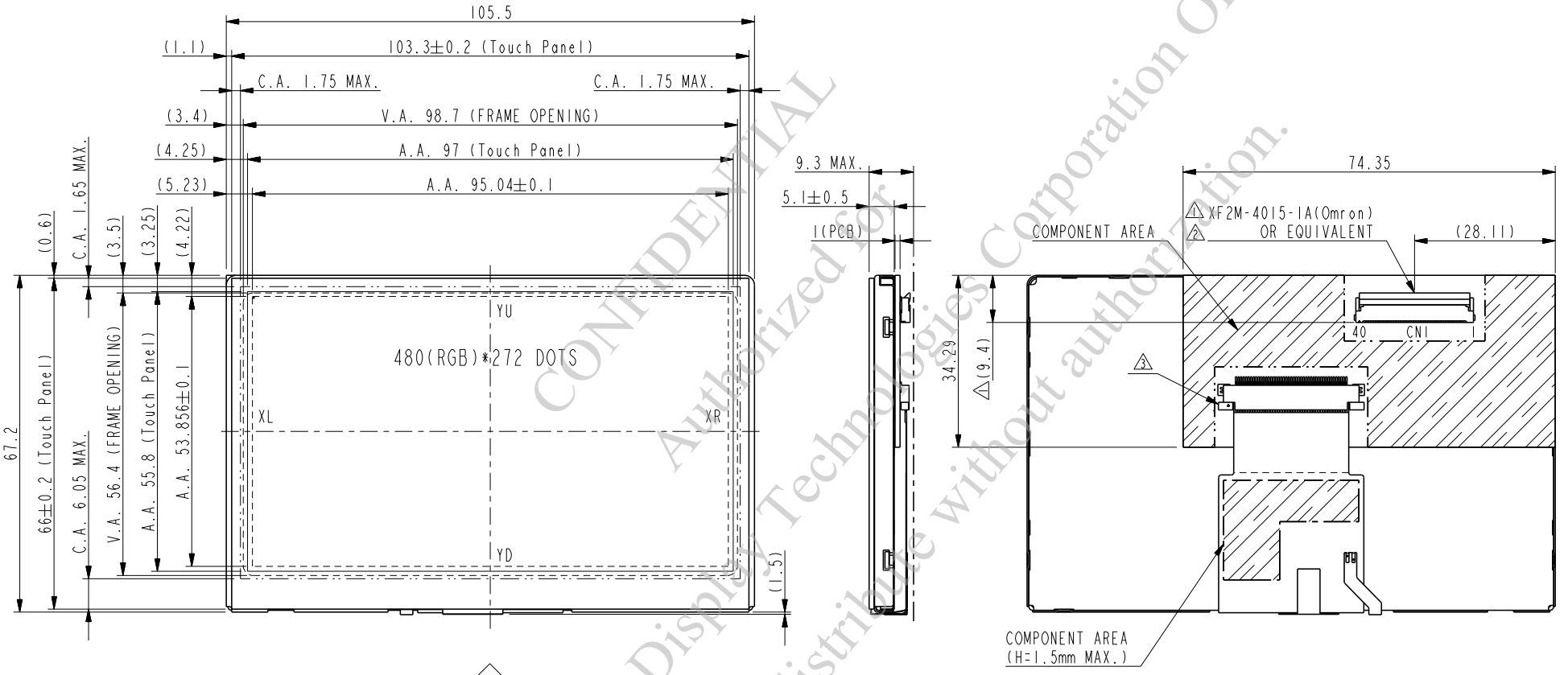
7. OUTLINE DIMENSIONS



VIEWING DIRECTION

Best Contrast but with Gray Level Inversion

UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.3mm
NOTE : MARK △3 MODIFY (NUMBER NOTE MODIFY VERSION)

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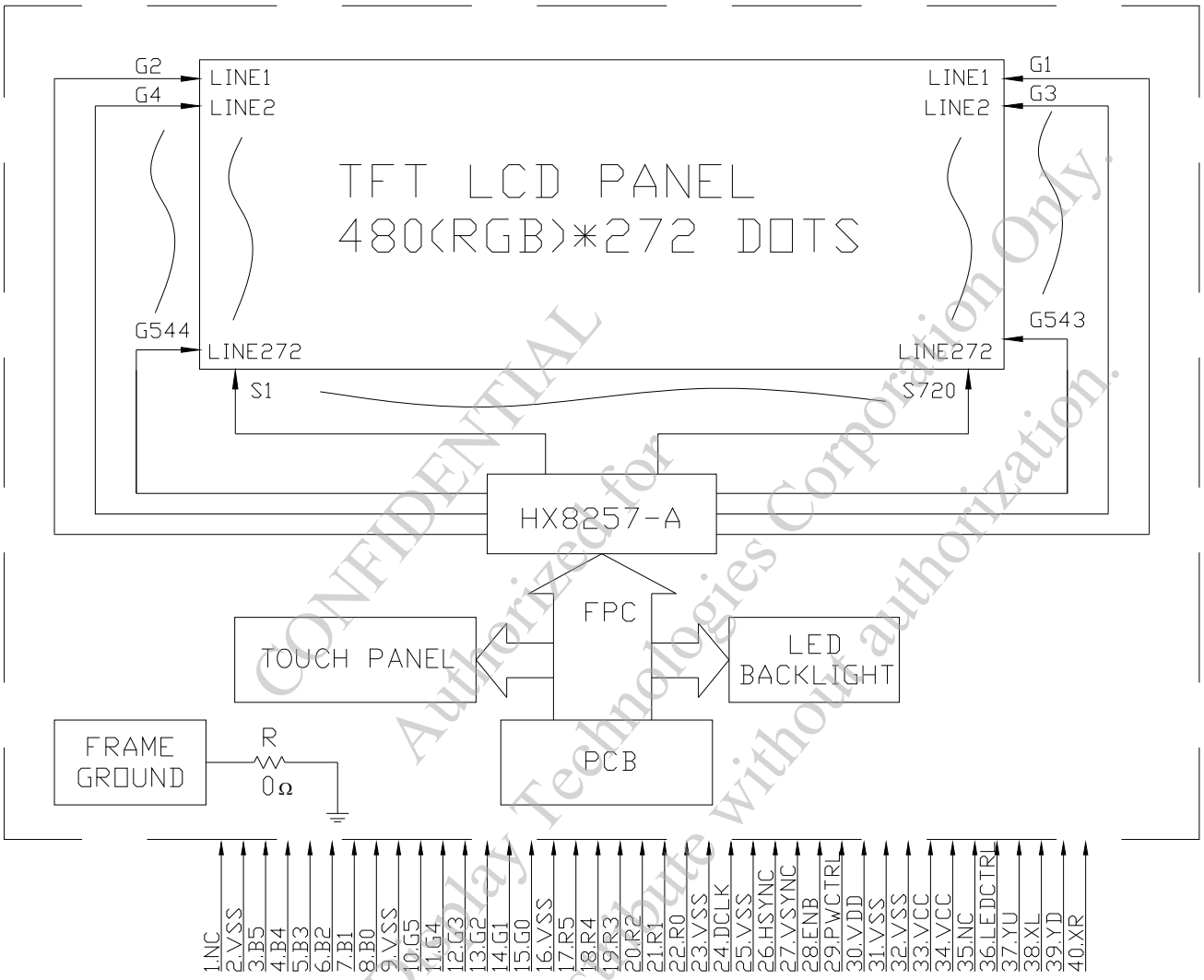
8 . BLOCK DIAGRAM



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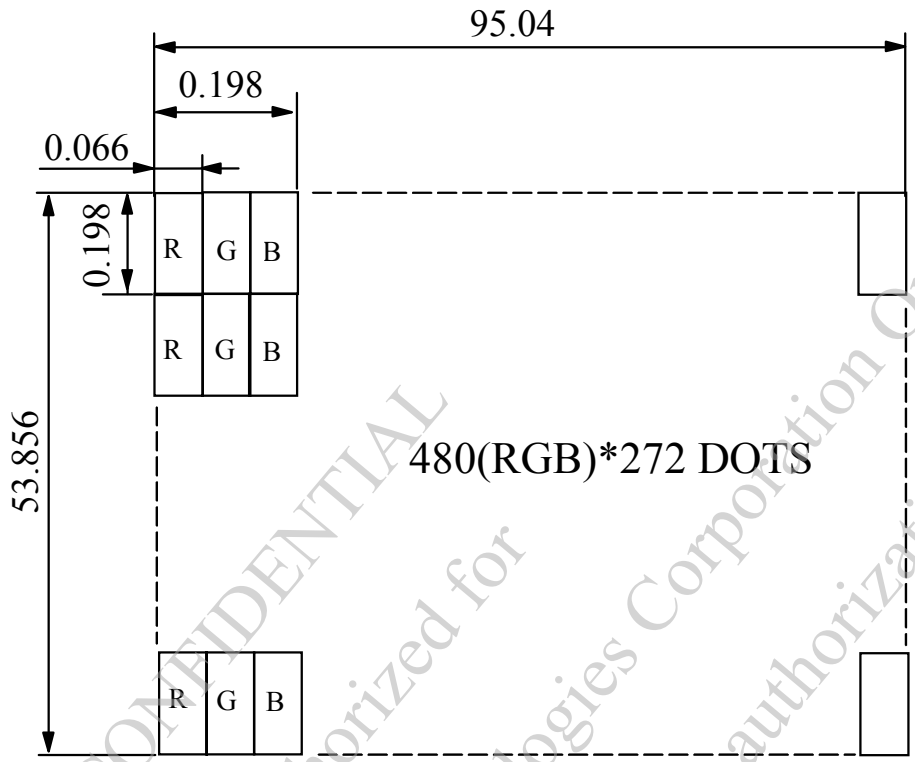
9. DETAIL DRAWING OF DOT MATRIX



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

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10. INTERFACE SIGNALS

PIN NO.	SYMBOL	I/O	FUNCTION
1	NC	—	NON CONNECTION
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 WITH NEGATIVE POLARITY. INTERNALLY PULL HIGH.
27	VSYNC	I	VERTICAL SYNC INPUT WITH NEGATIVE POLARITY. INTERNALLY PULL HIGH.
28	ENB	I	INPUT DATA ENABLE CONTROL. INTERNALLY PULLED LOW.

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PIN NO.	SYMBOL	I/O	FUNCTION
29	PWCTRL	I	LOGIC LEVEL H=3.3V L=0V: PWCTRL H = POWER ON; PWCTRL L = SHUTDOWN WHEN INTERNAL LED DRIVER : JP4 1-2(DEFAULT) WHEN EXTERNAL LED DRIVER : JP4 2-3
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	YU	—	TOP PANEL — TOUCH PANEL
38	XL	—	LEFT PANEL — TOUCH PANEL
39	YD	—	BOTTOM PANEL — TOUCH PANEL
40	XR	—	RIGHT PANEL — TOUCH PANEL

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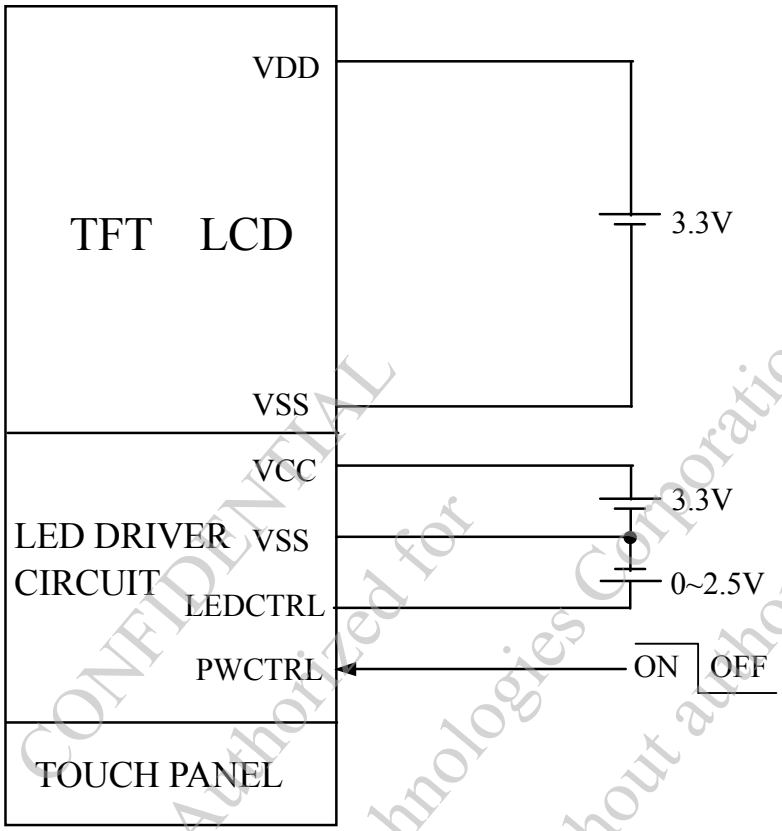
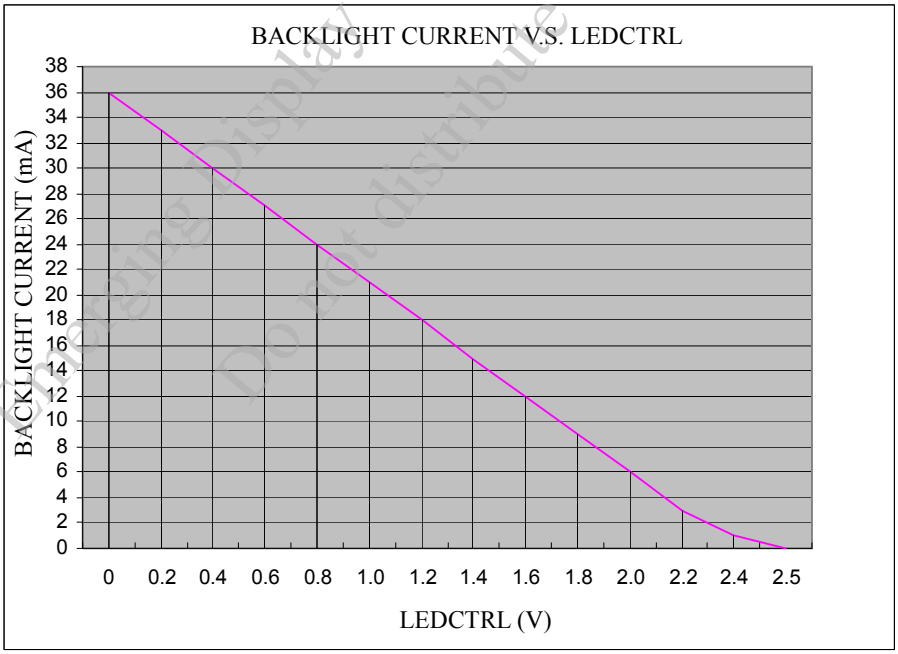
11 . POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



11.2 THE BRIGHTNESS CONTROLLED BY BACKLIGHT CURRENT OF LEDCTRL.



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12 . TOUCH PANEL SPECIFICATION

12.1 ELECTRICAL CHARACTERISTICS

Ta = 25°C

ITEM	CONDITION	SPEC.	UNIT
LINEARITY	—	≤ 1.5	%
TRANSMISSION	ASTM D1003	Min 80	%
TERMINAL RESISTANCE	X AXIS	440 ~ 1230	Ω
	Y AXIS	700 ~ 250	
INSULATION RESISTANCE	DC25V	≥ 20	MΩ
INPUT VOLTAGE	—	5(TYP)	V

12.2 PRECAUTIONS IN USE OF TOUCH PANEL

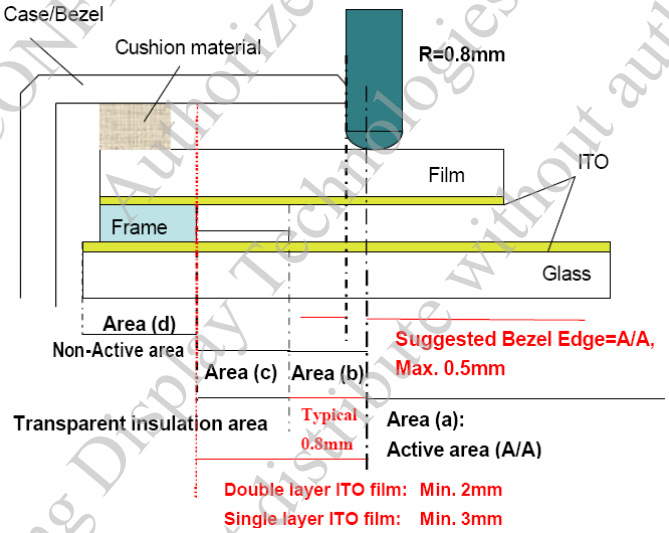
12.2.1 PURPOSE：

IN ORDER TO PREVENT ACCIDENTAL USE AND PERFORMANCE DETERIORATION, PLEASE KEEP THE FOLLOWING PRECAUTIONS AND INHIBITED POINTS.

12.2.2 ITEM AND ILLUSTRATION：

(1) STRUCTURE, AREA DEFINITION

THE STRUCTURE AND THE PERFORMANCE GUARANTEED AREA OF THIS TOUCH PANEL ARE DEFINED BELOW：



THE ABOVE FIGURE IS OUR DESIGN RULE OF TOUCH PANEL.
IF IT CANNOT MEET YOUR REQUIREMENT, PLEASE CONTACT WITH OUR ENGINEERS FOR FURTHER DISCUSSION.

ABOVE FIGURE ILLUSTRATES THE RECOMMENDED BEZEL AND CUSHION DESIGN. IN ORDER TO PREVENT
UNUSUAL PERFORMANCE DEGRADATION AND MALFUNCTION OF A TOUCH PANEL, PLEASE CARRY OUT THE SET
CASE DESIGNING AND A TOUCH PANEL ASSEMBLING METHOD AFTER SURELY CONSIDERING THE DEFINITION OF EACH AREA ILLUSTRATED IN ABOVE FIGURE.

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AREA(a)：ACTIVE AREA
THE ACTIVE AREA IS GUARANTEED THE POSITION DATA DETECTABLE PRECISION, OPERATION FORCE AND OTHER OPERATIONS. IT IS STRONGLY RECOMMENDED TO PLACE THE OPERATION BUTTON OR MENU KEYS WITHIN THE ACTIVE AREA. DUE TO STRUCTURE, THE ACTIVE AREA IS LESS DURABLE AT THE EDGE OR CLOSE TO THE EDGE.

AREA(b)：OPERATION NON-GUARANTEED AREA
THIS AREA DOES NOT GUARANTEE A TOUCH PANEL OPERATION AND ITS FUNCTION. WHEN THIS AREA IS PRESSED, TOUCH PANEL SHOWS DEGRADATION OF ITS PERFORMANCE AND DURABILITY SUCH AS A PEN SLIDING DURABILITY BECOMES ABOUT ONE-TENTH COMPARED WITH THE ACTIVE AREA (AREA-(A) AS GUARANTEED AREA) AND ITS OPERATION FORCE REQUIRES ABOUT DOUBLE. ABOUT 0.5 MM OUTSIDE FROM A BOUNDARY OF THE ACTIVE AREA CORRESPONDS TO THIS AREA.

AREA(c)：PRESSING PROHIBITION AREA
THE AREA WHICH FORBIDS PRESSING, BECAUSE AN EXCESSIVE LOAD IS APPLIED TO A TRANSPARENT ELECTRODE (ITO) AND A SERIOUS DAMAGE IS GIVEN TO A TOUCH PANEL FUNCTION BY PRESSING.

AREA(d)：NON-ACTIVE AREA
THE AREA DOES NOT ACTIVATE EVEN IF PRESSED.

(2) CAUTIONS FOR INSTALLING AND ASSEMBLING
(i) DO NOT GIVE EXCESSIVE STRAIN TO THE PRODUCT.

(ii) FLEXIBLE PATTERN CABLE IS CONNECTED TO THE BODY BY THERMAL PRESSURE METHOD. SO, DO NOT APPLY EXCESSIVE FORCES TO THE FLEXIBLE PATTERN. DO NOT ADD AN EXCESSIVE FORCE TO A FPC (FLEX TAIL) THAT MAKES PEELING OFF OF THE FPC FROM THE PRODUCT. DO NOT FIX, ADHERE OR MOUNT ANY ADDITIONAL GOODS ON THE FPC SUCH AS ADDITIONAL FILM/PLATE ON THE FPC, BECAUSE SUCH ADDITIONAL GOODS WILL APPLY A STRESS AT THE FPC BONDING AREA. IT MAY AFFECT THE CONDUCTIVITY OF FPC WITH TOUCH PANEL.

(iii) IN ORDER NOT TO APPLY LOAD ON THE DISPLAY, PROVIDE A CLEARANCE OF AT LEAST 0.3MM BETWEEN THE PRODUCT AND DISPLAY.

(iv) WE RECOMMEND THE DESIGN OF A CASE OR BEZEL SHOULD COVERS THE BOUNDARY OF THE ACTIVE AREA INSIDE IN ORDER TO PREVENT AN OPERATION AT OUTSIDE OF THE ACTIVE AREA WHICH CAN NOT GUARANTEE THE FUNCTION OR DURABILITY (REFER TO ITEM 5.1.2. STRUCTURE, AREA DEFINITION).
BEZEL'S EDGE PART MAY GUIDE THE PEN SLIDING ON THE SAME POSITION REPEATEDLY. IF THE BEZEL IS PLACED OUTSIDE OF THE ACTIVE AREA, IT MAY CAUSE THE DAMAGE OF THE ITO FILM.

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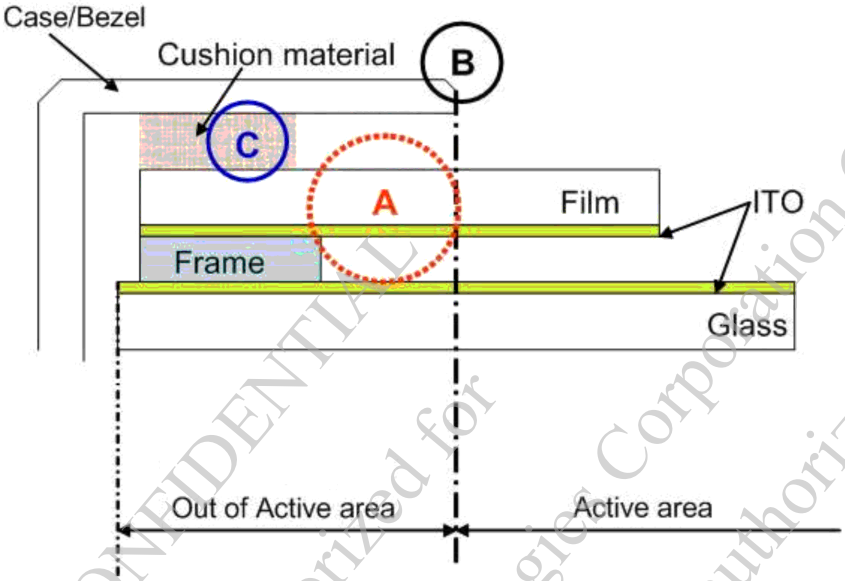
(v) PRESSING INSIDE OF BOUNDARY OF THE FRAME(PART (A) AS SHOWN IN BELOW) MAY CAUSES FAULT OPERATION, SO PLEASE DESIGN TO AVOID PRESSING OF TOUCH PANEL AT PART (A) SUCH AS HAVING GASKET/CUSHION AT PART (C). PARTICULARLY THE AREA (B) SHALL BE FREE FROM BURR. THE GASKET/CUSHION MATERIAL AT THE PART (C) SHOULD NOT BE EXCEEDED TO INSIDE OF THE BOUNDARY OF THE FRAME.



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(vi) TO PREVENT GIVING DISTORTION TO THE FILM OF THE PRODUCT AND PEELING OFF OF THE FILM FROM THE PRODUCT, DO NOT FIX THE FILM AND A SET CASE OR A SHOCK ABSORBING MATERIAL ADHERED TO A SET CASE BY ADHESION.

(vii) WIPE OFF THE STAIN ON THE PRODUCT BY USING SOFT CLOTH MOISTENED WITH ETHANOL. TAKE CARE NOT TO ALLOW ETHANOL TO SOAK INTO THE JOINT OF UPPER FILM AND BOTTOM GLASS. IT MAY OTHERWISE CAUSE PEELING OR DEFECTIVE OPERATION. DO NOT USE ANY ORGANIC SOLVENT OR DETERGENT OTHER THAN ETHANOL.

(viii) THE CORNERS OF THE PRODUCT ARE NOT CHAMFERED AND ARE SHARP. WHEN POSITIONING AND FIXING THE PRODUCT ON THE CASE, PROVIDE A ROUND PART ON THE CORNER OF THE CASE SO AS NOT TO APPLY LOAD ON THE CORNER OF THE TRANSPARENT TOUCH PANEL.

(ix) DO NOT PRESS THE FILM OF THE PRODUCT WHEN THIS PRODUCT IS BUILT INTO A SET.

(3) CAUTIONS FOR OPERATION

(i) OPERATE IT WITH A POLYACETAL PEN (TIP R0.8 OR OVER) OR A BELLY OF A FINGER WITHOUT APPLYING EXCESSIVE LOAD. NEVER USE ANY MECHANICAL PENCILS, BALL POINT PENS AND HARD FINGERTIPS WHO'S TIP IS HARD FOR INPUT, OTHERWISE MALFUNCTIONS MAY RESULT.

(ii) THE INPUT POSITION MAY BE FLUCTUATED A LITTLE THROUGH LONG-TIME USE. IT IS DESIRABLE TO PROVIDE A ZERO-ADJUSTMENT FUNCTION BY USING A CIRCUIT AND SOFTWARE.

(iii) OPERATION AT THE OUT OF ACTIVE AREA IS OUT OF OUR GUARANTEE. IT CAUSES A SERIOUS DAMAGE OF A TRANSPARENT ELECTRODE. DO NOT OPERATE AT THE OUT OF ACTIVE AREA.

(iv) IN CASE OF CLEANING THE PART OF THE CASE BOUNDARY OF ACCOMPLISHED SET, USE A SOFT CLOTH WITH A FINGER BERRY OR A COTTON BUD. DO NOT CLEAN WITH A THI NG OTHER THAN THE FINGER SUCH AS HARD OR SHARP EDGES LIKE A FINGER NAIL ETC. ON THE CLOTH, BECAUSE IT CAUSE TRANSPARENT CONDUCTIVE FILM CRACKS. PLEASE ADVISE THIS PROHIBITION TO YOUR LAST CUSTOMERS.

12.3 DURABILITY

12.3.1 STYLUS HITTING：
ONE MILLION TIMES OR OVER
NO DAMAGE ON FILM SURFACE
PEN：R8 mm SILICON RUBBER
LOAD：250g
FREQUENCY：240 times/min
MEASUREMENT POSITION:
1 POINT OF TOUCH PANEL ACTIVE AREA
REPEATED：OVER 1,000,000 TIMES

12.3.2 PEN TOUCH SLIDING DURABILITY：
100,000 TIMES OR OVER
WRITING WITH R0.8mm PLASTIC STYLUS PEN; WRITING FORCE 150g
IN ACTIVE AREA.
SPEED IS 60mm/sec.

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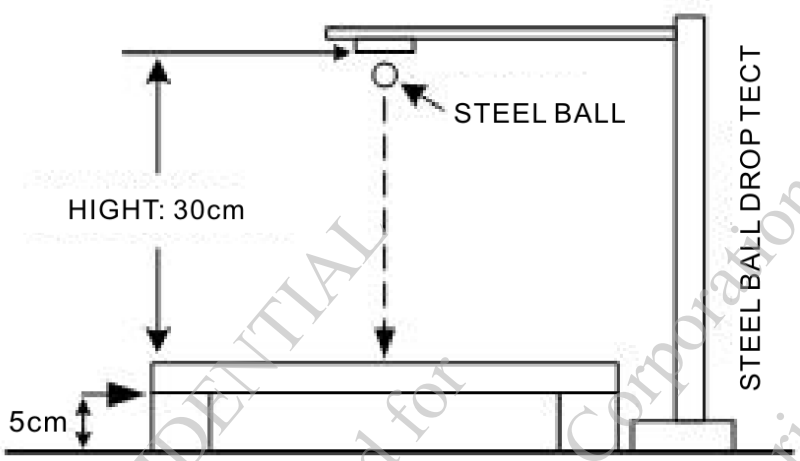
12.4 STEEL BALL DROP TEST

BY USING F9mm STEEL BALL FROM THE HEIGHT OF 30cm AND FALLING ON TOUCH PANEL SURFACE, MUST PASS BELOW CONDITIONS：

APPEARANCE：THE APPEARANCE WITHOUT ANY CHANGE, INCLUDING THE PANEL BROKEN.



12.5 APPEARANCE INSPECTION

PURPOSE：

TO ESTABLISH APPEARANCE STANDARD AND MAINTAIN PRODUCT QUALITY。

SCOPE：

TOUCH PANEL VIEW AREA WITHIN TOUCH PANEL。

12.5.1 RULE：

INSPECTION CONDITION

(A) ENVIRONMENTAL LUMINANCE：500 LUX。

(B) DISTANCE BETWEEN HUMAN EYES AND PANEL：30 CM

(PANEL MUST BE TESTED UNDER LIGHT TRANSPARENT)。

(C) VISUAL ANGEL：＞60°。

(D) LIGHT SOURCE：FLUORESCENT LIGHT SOURCE。

12.5.2 JUDGE CRITERION：

JUDGEMENT UNDER ABOVE MENTIONED CRITERION (PANEL MUST BE TESTED UNDER LIGHT TRANSPARENT),

TESTING GOODS DEFECT CAN BE VISIBLE WITHIN 10 SECONDS, WHICH WILL BE JUDGED AS MAJOR DEFECTS。

SAMPLING STANDARD：

THE SAMPLING STANDARD WILL BE CONFIRMED BY BOTH OF EDT AND CUSTOMER.

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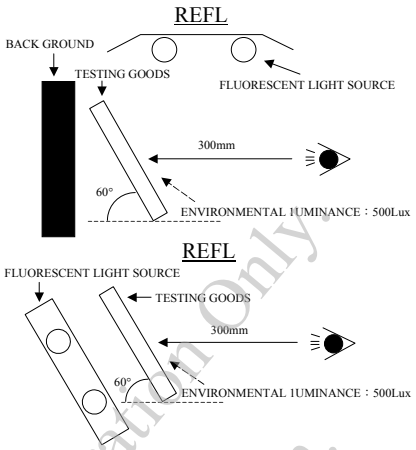
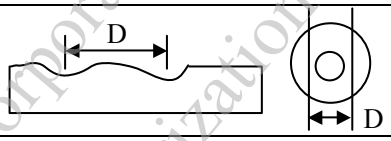
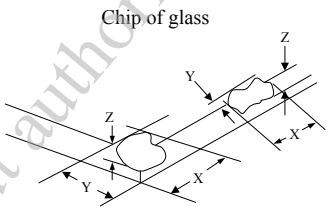
INSPECTION ITEMS	SEPC.		JUDGE CRITERION	OPERATION GUIDELINE
SCRATCH	W ≥ 0.10mm or L ≥10mm		NOT ACCEPTABLE	
	0.10mm > W > 0.05mm and L < 10mm		MAX. 4EA EA	
	W < 0.05mm and L< 10mm		ACCEPTABLE	
LINEAR FOREIGN OBJECT	W ≤ 0.05mm & L ≤3mm		ACCEPTABLE	
	W > 0.05mm or L >3mm		NOT ACCEPTABLE	
GRANULAR FOREIGN OBJECT	D ≤ 0.1mm		ACCEPTABLE	
	0.1mm < D ≤ 0.2mm		MAX. 5 EA	
	0.2mm < D ≤ 0.3mm		MAX. 3 EA	
	D >0.30mm		NOT ACCEPTABLE	
PET BUBBLES	D ≤0.5mm		ACCEPTABLE	
	D >0.5mm		NOT ACCEPTABLE	
CHIP ON GLASS	CORNER	X ≤ 1.5mm 、Y ≤ 1.5mm 、Z ≤ t (t = /thickness)	ACCEPTABLE	
	EDGE	X ≤ 3mm 、Y ≤ 1.5mm 、Z ≤ t		

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13. INSPECTION CRITERION

13.1 APPLICATION

THIS INSPECTION STANDARD IS TO BE APPLIED TO THE LCD MODULE DELIVERED FROM EMERGING DISPLAY TECHNOLOGIES CORP.(E.D.T) TO CUSTOMERS

13.2 INSPECTION CONDITIONS

13.2.1 (1)OBSERVATION DISTANCE：35cm±5cm

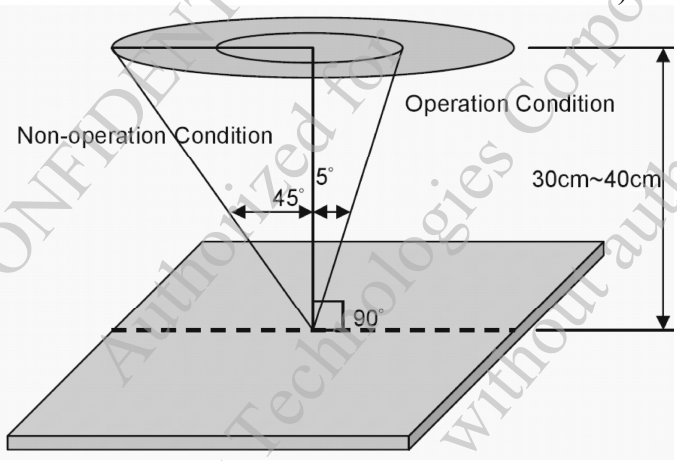
(2)VIEW ANGLE：

NON-OPERATION CONDITION：±5°

(PERPENDICULAR TO LCD PANEL SURFACE)

OPERATION CONDITION：±45°

(PERPENDICULAR TO LCD PANEL SURFACE)



13.2.2 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

13.2.3 INSPECTION LOT

QUANTITY PER DELIVERY LOT FOR EACH MODEL

13.2.4 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

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13.3 INSPECTION STANDARDS

13.3.1 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 PCB/FPC 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	

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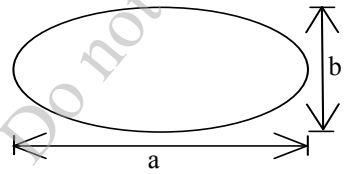
13.3.2 MODULE DEFECTS CLASSIFICATION

<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>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>

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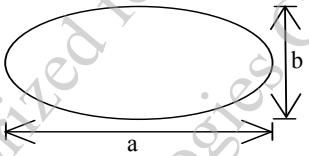
<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td>6.</td><td>BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS</td><td>
<table>
<tr><th></th><th>AVERAGE DIAMETER (mm) : D</th><th>NUMBER OF PIECES PERMITTED</th></tr>
<tr><td rowspan="3">BUBBLE ON THE POLARIZER</td><td>D ≤ 0.25</td><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 OF OTHER CONTAMINATION.
(2)BEZEL MUST COMPLY WITH JOB SPECIFICATIONS.</td></tr>
<tr><td>11</td><td>PCB / FPC</td><td>(1)THERE MAY NOT BE MORE THAN 2mm OF SEALANT OUTSIDE THE SEAL AREA ON THE PCB/FPC, AND THERE SHOULD BE NO MORE THAN THREE PLACES.
(2)NO OXIDATION OR CONTAMINATION PCB TERMINALS.
(3)PARTS ON PCB/FPC 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/FPC 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>

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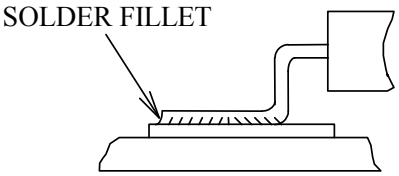
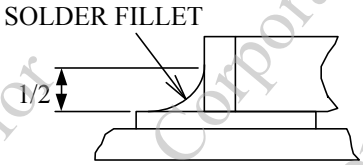
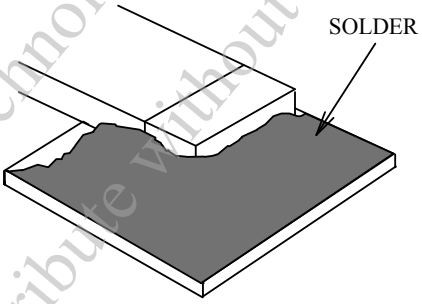
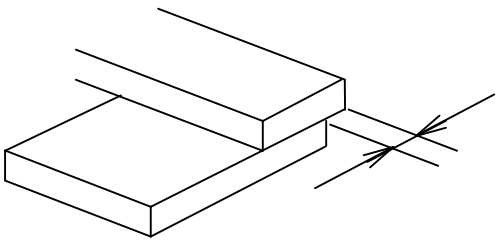
NO.	ITEM	CRITERIA
12.	SOLDERING	(1)NO SOLDERING FOUND ON THE SPECIFIED PLACE (2)INSUFFICENT SOLDER (a)LSI, IC A POOR WETTING OF SOLDER IS BETWEEN LOWER BEND OR "HEEL" OF LEAD AND PAD  (b)CHIP COMPONENT · SOLDER IS LESS THAN 50% OF SIDES AND FRONT FACE WETTING  • SOLDER WETS 3 SIDES OF TERMINAL, BUT LESS 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 

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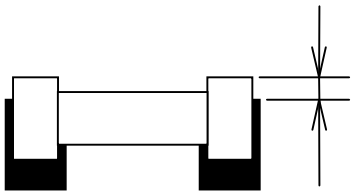
NO.	ITEM	CRITERIA
12.	SOLDERING	(b)CHIP COMPONENT COMPONENT IS OFF CENTER, AND MORE THAN 50% OF THE LEADS IS OFF THE PAD OUTLINE  (4)NO UNMELTED SOLDER PASTE MAY BE PRESENT ON THE PCB. (5)NO COLD SOLDER JOINTS, MISSING SOLDER CONNECTIONS, OXIDATION OR ICICLE. (6)NO RESIDUE OR SOLDER BALLS ON PCB. (7)NO 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.

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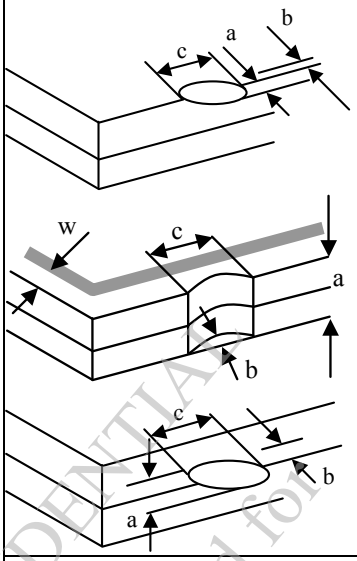
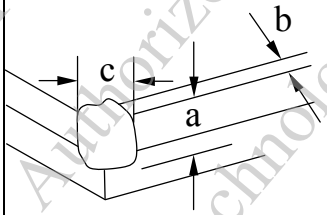
<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td rowspan="4">15.</td><td rowspan="4">CRACKED GLASS</td><td colspan="2">THE LCD WITH EXTENSIVE CRACK IS NOT ACCEPTABLE</td></tr>
<tr><td>GENERAL GLASS CHIP：
 
</td><td>
<table>
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>≤ t/2</td>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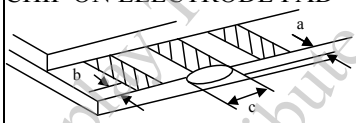
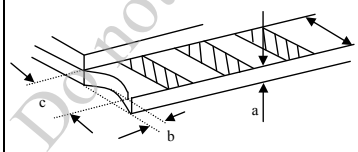
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>≤ t/2</td><td>< VIEWING AREA</td><td>≤ 1/8X</td></tr>
<tr><td>> t/2 , ≤ 2t</td><td>≤ W/2</td><td>≤ 1/8X</td></tr>
</table>
*W=DISTANCE BETWEEN SEALANT AREA AND LCD PANEL EDGE
X = LCD SIDE LENGTH
t = GLASS THICKNESS</td></tr>
<tr><td>CHIP ON ELECTRODE PAD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

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13.4 RELIABILITY TEST

13.4.1 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 ~ +80°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.

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13.5 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

13.6 OPERATION

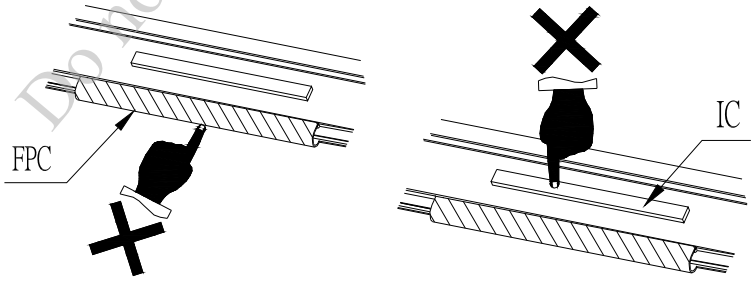
13.6.1 DO NOT CONNECT OR DISCONNECT MODULES TO OR FROM THE MAIN SYSTEM WHILE POWER IS BEING SUPPLIED .

13.6.2 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 .

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

13.6.4 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 .

13.6.5 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!



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13.7 NOTICE

13.7.1 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 .

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

13.7.3 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 .

13.7.4 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 .

13.7.5 DON'T GIVE EXTERNAL SHOCK.

13.7.6 DON'T APPLY EXCESSIVE FORCE ON THE SURFACE.

13.7.7 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.

13.7.8 DON'T OPERATE IT ABOVE THE ABSOLUTE MAXIMUM RATING.

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

13.7.10 STORE WITHOUT ANY PHYSICAL LOAD.

13.7.11 REWIRING: NO MORE THAN 3 TIMES.

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