EXAMINED BY : Kevin Kuo	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO. CAS-0008569
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APPROVED BY: Chris Wu		TOTAL PAGE : 24
		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

ETML1010F8DHA

(RoHS)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL NO.	VERSION	PAGE
	ETML1010F8DHA	1	0-1

RECORDS OF REVISION

DOC. FIRST ISSUE

JAN.05, 2018

DATE	REVISED PAGE NO.	SUMMARY

TABLE OF CONTENTS

1. GENERAL SPECIFICATIONS

1.1 DATA SHEETS FOR CAPACITIVE TOUCH PANEL CONTROLLER/DRIVER PLEASE REFER TO：

EETI EXC3000
EETI EX5418
EETI EX5962

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

2.1 TFT LCD MODULE MECHANICAL SPECIFICATIONS

(1)	DISPLAY SIZE	10.1 inch
(2)	NUMBER OF DOTS	1920W * (RGB) * 1200H DOTS
(3)	MODULE SIZE	257.9W * 178.5H * 5D mm (NOT INCLUDED FPC & PROTECT FILM)
(4)	VIEWING AREA	217.58W * 136.36H mm
(5)	ACTIVE AREA	216.58W * 135.36H mm
(6)	PIXEL SIZE	0.1128W * 0.1128H mm
(7)	LCD TYPE	TFT , TRANSMISSIVE, GLARE, NORMALLY BLACK
(8)	COLOR	16.7M
(9)	VIEWING DIRECTION	SUPER WIDE VIEW
(10)	BACK LIGHT	LED , COLOR : WHITE
(11)	INTERFACE MODE	eDP 2 LANES

2.2 CAPACITIVE TOUCH PANEL MECHANICAL SPECIFICATIONS

(1)	TOUCH PANEL SIZE	10.1 inch
(2)	OUTER DIMENSION	257.9W * 178.5H * 1.95D mm (NOT INCLUDED FPC & PROTECT FILM)
(3)	VIEWING AREA	217.58W * 136.36H mm
(4)	ACTIVE AREA	219.54W * 138H mm
(5)	INPUT TYPE	MULTI TOUCH
(6)	NUMBER OF TOUCH SENSOR	53 * 33 SENSORS
(7)	INTERFACE MODE	USB
(8)	RESOLUTION	4096 * 4096

3. ABSOLUTE MAXIMUM RATINGS

3.1 LCD MODULE ELECTRICAL ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
SUPPLY VOLTAGE FOR LOGIC	VCC-VSS	-0.3	5	V	
INPUT SIGNAL VOLTAGE	VI	-0.3	VCC	V	
LED BACKLIGHT CURRENT	ILED	0	(25)	mA	FOR EACH LED

3.2 CAPACITIVE TOUCH PANEL ELECTRICAL ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY FOR DRIVER IC	VDD-GND	-0.3	4	V	
DC INPUT VOLTAGE	VIN	GND-0.3	VDD+0.3	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)

NOTE (1)： TEST METHOD AND CONDITIONS：
CAPACITOR IS CHARGED UP TO 200 pF BY STATIC VOLTAGE, THEN
CONNECT WITH DISPLAY MODULE INTERFACE PINS FOR DISCHARGE.

3.3 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	0°C	5 0 °C	- 2 0 °C	6 0 °C	NOTE (1)
HUMIDITY	NOTE (2)		NOTE (2)		WITHOUT CONDENSATION
VIBRATION	—	2.45 m /s^2 (0.25 G)	—	11.76 m /s^2 (1.5 G)	5-100-5 Hz XYZ DIRECTIONS 1 Hr. EACH
SHOCK	—	29.4 m /s^2 (3 G)	—	490.0 m /s^2 (50 G)	10ms XYZ DIRECTIONS 1 TIME EACH

NOTE (1)： Ta AT -20°C：WILL BE < 48hrs
60°C：WILL BE < 48hrs

NOTE (2)： Ta ≤ 40°C：90%RH MAX. (48HRS MAX.)
Ta > 40°C：ABSOLUTE HUMIDITY MUST BE LOWER THAN 90%RH AT 40°C.
(48HRS MAX.)

4. ELECTRICAL CHARACTERISTICS

4.1 LCD MODULE ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
SUPPLY VOLTAGE FOR LOGIC	VCC-VSS	—	3.0	3.3	3.6	V
SUPPLY CURRENT (WHITE PATTEN)	ICC	—	—	240	350	mA
POWER SUPPLY VOLTAGE FOR LED DRIVER	VLED	—	(26)	(29)	(32)	V
POWER SUPPLY CURRENT FOR LED DRIVER	IVLED	VLED=12V	—	(21.7)	—	mA

4.2 CAPACITIVE TOUCH PANEL ELECTRICAL CHARACTERISTICS

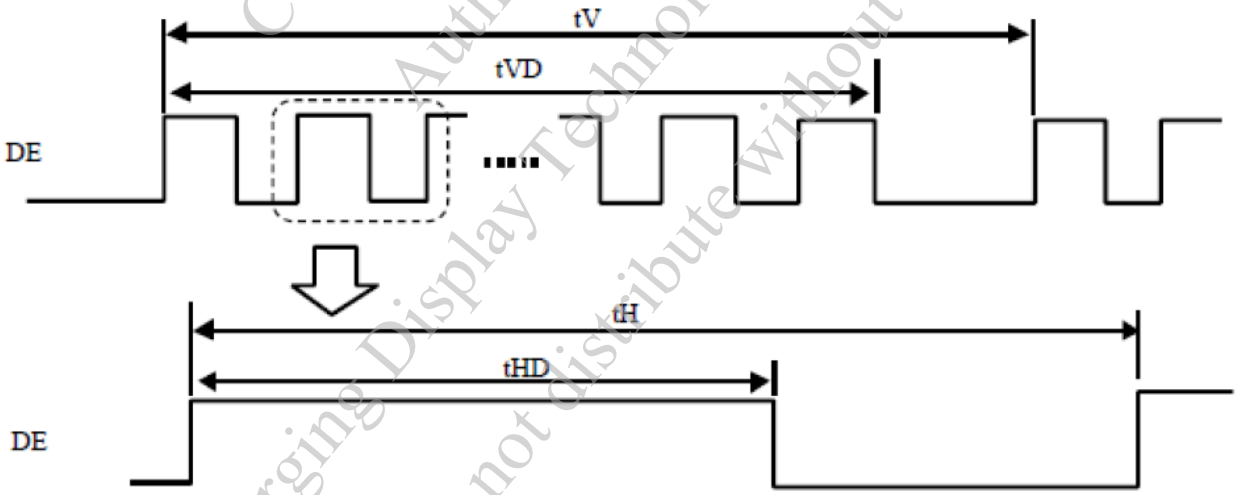
Ta=25°C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY	VDD-GND	—	3.0	3.3	3.6	V
CURRENT CONSUMPTION FOR OPERATION	I_{DD}	VDD-GND=3.3V	—	95	120	mA

5. TIMING CHARACTERISTICS

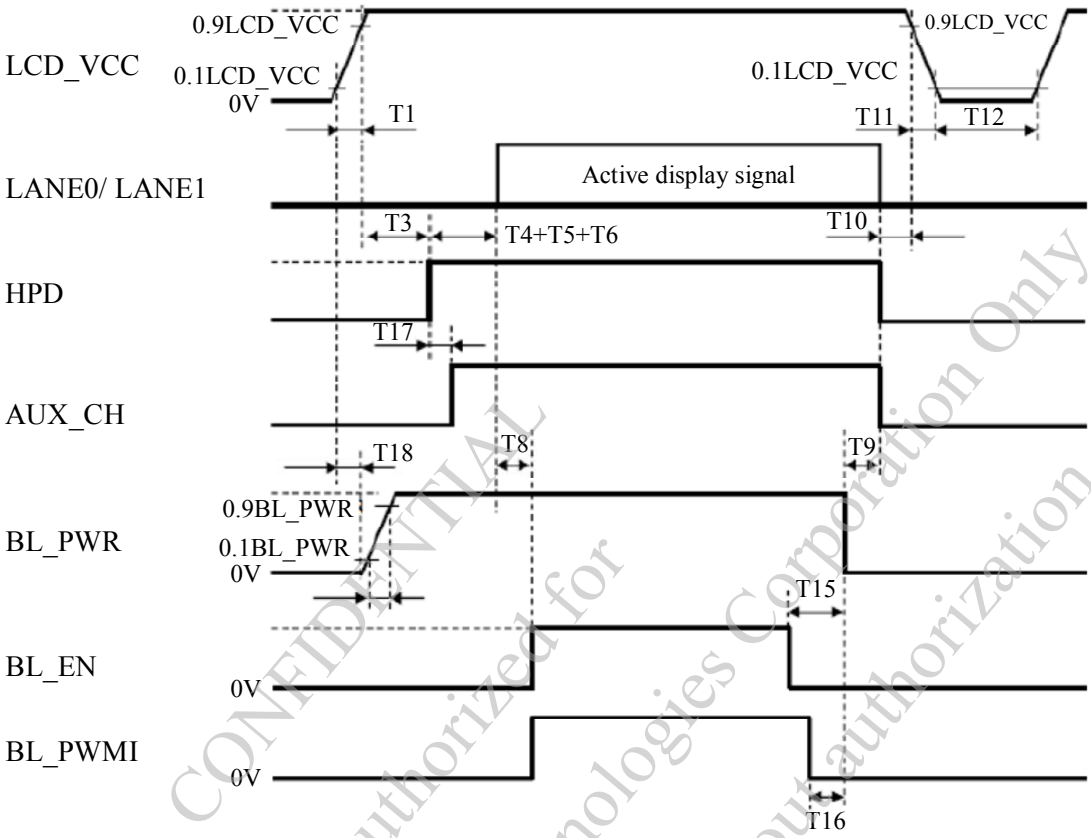
5.1 eDP SIGNAL TIMING CHARACTERISTICS

5.1.1 SYNCHRONIZATION SIGNAL TIMING



DESCRIPTION	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
VERTICAL FREQUENCY	fV	47	60	62	Hz	
VERTICAL PERIOD	tV	1229	1278	1310	tH	
VERTICAL VALID	tVD		1200		tH	
HORIZONTAL FREQUENCY	fH	58	77	81	kHz	
HORIZONTAL PERIOD	tH	2080	2144	2216	tCLK	
HORIZONTAL VALID	tHD		1920		tCLK	

5.1.2 TIMING TABLE



ITEM	MIN.	TYP.	MAX.	UNIT	REMARK
T1	(1)	—	10	ms	
T3	—	(50)	—	ms	
T4+T5+T6	—	—	—	ms	NOTE (1)
T8	33.3	—	—	ms	NOTE (2)
T9	0	—	—	ms	
T10	(100)	—	—	ms	
T11	—	—	10	ms	
T12	500	—	—	ms	NOTE (3)
T15	0	—	—	ms	
T16	0	—	—	ms	
T17	0	—	—	ms	
T18	0	—	—	ms	
T19	1	—	10	ms	NOTE (4)

NOTE (1) : IT IS NECESSARY TO WAIT THE PERIOD OF LINK TRAINING COMPLETION.

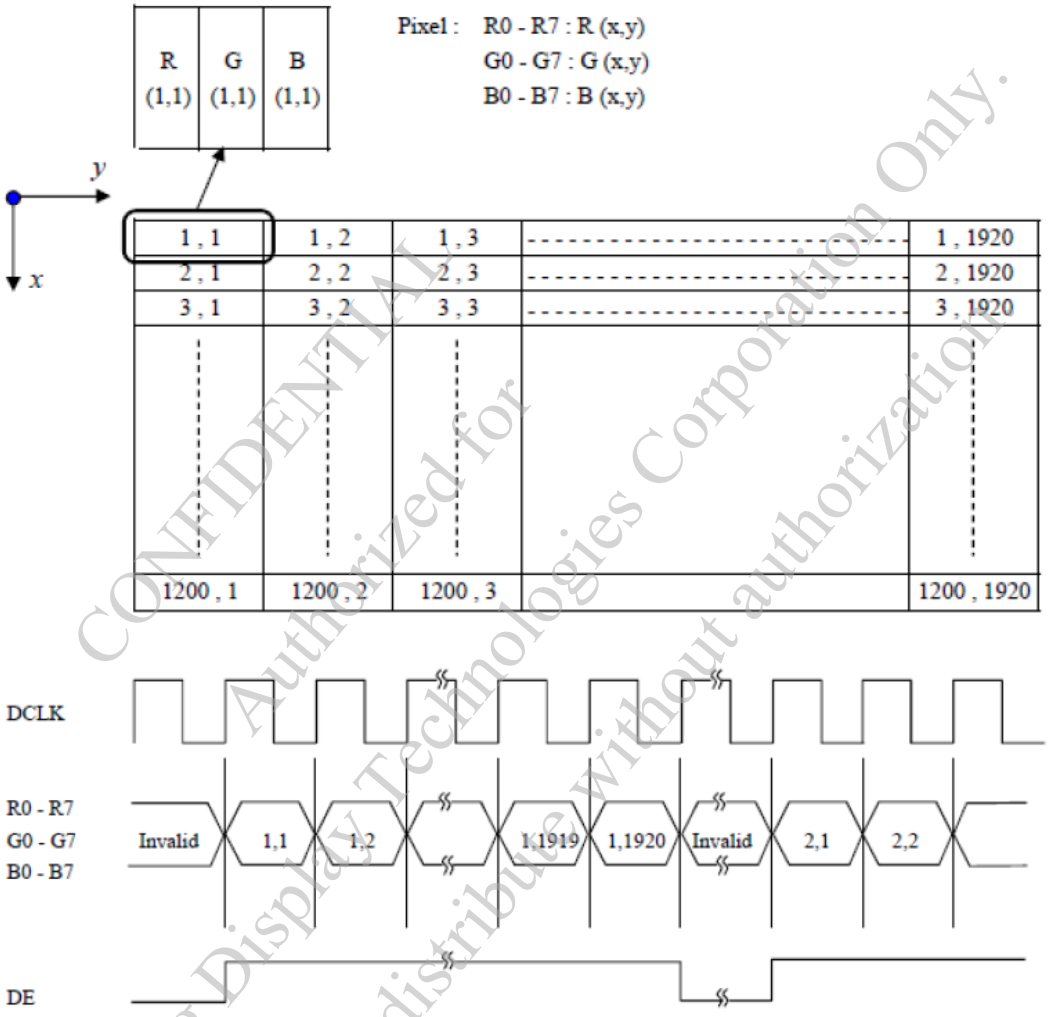
NOTE (2) : AT REFRESH RATE OF 60Hz.

NOTE (3) : REBOOTING WITHOUT DISCHARGING LCD_VCC TO 0V CAN NOT BE GUARANTEED (INCLUDING INSTANTANEOUS VOLTAGE DROP). ONCE LCD_VCC FALL BELOW MIN. DEFINED VOLTAGE (=3.0V), PREDEFINED SEQUENCE IS REQUIRED.

NOTE (4) : BL_PWR SHOULD REACH TO MIN. DEFINED VOLTAGE (=3.0V) BEFORE BL_EN AND BL_PWM GOES “HIGH”.

5.1.3 eDP DATA INPUT FORMAT

CORRESPONDENCE BETWEEN INPUT DATA AND DISPLAY IMAGE
DISPLAY DATA OF ADJACENT TWO PIXEL IS LATCHED DURING FOUR CYCLE OF CLK

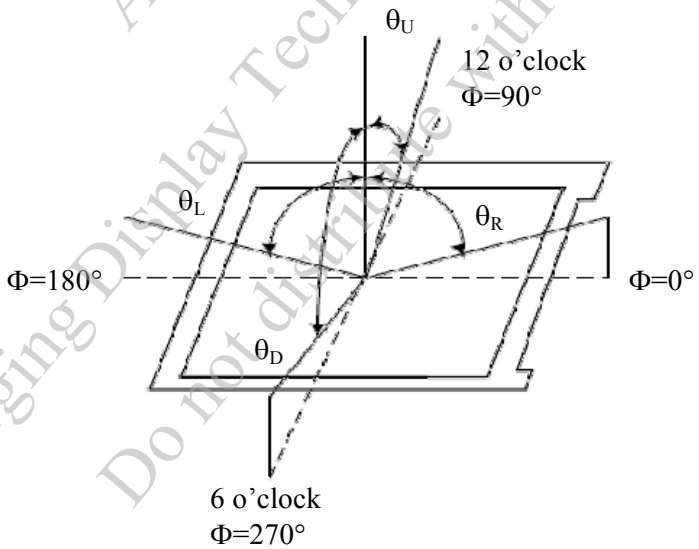


6. OPTICAL CHARACTERISTICS

6.1 OPTICAL CHARACTERISTICS

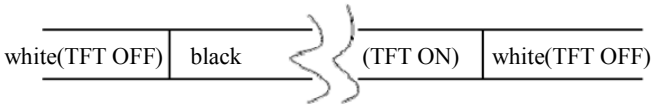
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
RESPONSE TIME	Tr + Tf	θ=0° ∅=0° Ta=25°C ILED=21.7mA	—	30	30	ms	NOTE (1) NOTE (3)
CONTRAST RATIO	CR		600	800	—	—	NOTE (1) NOTE (2) NOTE (4)
LUMINANCE UNIFORMITY	δ WHITE		75	80	—	%	NOTE (5)
SURFACE LUMINANCE	Lv		(850)	(950)	—	cd/m^2	NOTE (1) NOTE (4) NOTE (5)
VIEWING ANGLE RANGE	θ	∅=90°	(80)	—	—	deg	NOTE (1) NOTE (4)
		∅=270°	(80)	—	—	deg	
		∅=0°	(80)	—	—	deg	
		∅=180°	(80)	—	—	deg	
CIE (X,Y) CHROMATICITY	RED x	θ=0° ∅=0° Ta=25°C VLED=12V	(0.56)	(0.60)	(0.62)	—	NOTE (4) NOTE (5)
	RED y		(0.32)	(0.35)	(0.38)	—	
	GREEN x		(0.27)	(0.30)	(0.33)	—	
	GREEN y		(0.57)	(0.60)	(0.63)	—	
	BLUE x		(0.12)	(0.15)	(0.18)	—	
	BLUE y		(0.12)	(0.15)	(0.18)	—	
	WHITE x		(0.26)	(0.31)	(0.36)	—	
	WHITE y		(0.28)	(0.33)	(0.38)	—	

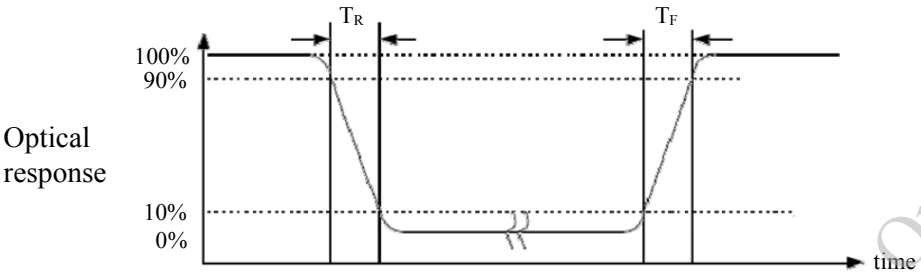
NOTE (1)：DEFINITION OF VIEWING ANGLE：



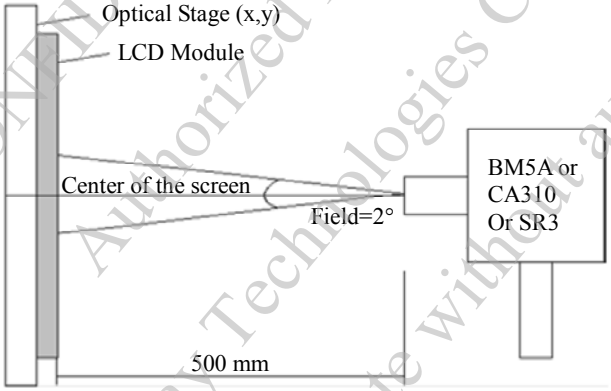
NOTE (2)：DEFINITION OF CONTRAST RATIO (CR) : MEASURED AT THE CENTER POINT OF PANEL
CR = LUMINANCE WITH ALL PIXELS WHITE/LUMINANCE WITH ALL PIXELS BLACK

NOTE (3)：DEFINITION OF RESPONSE TIME: SUM OF T_R AND T_F

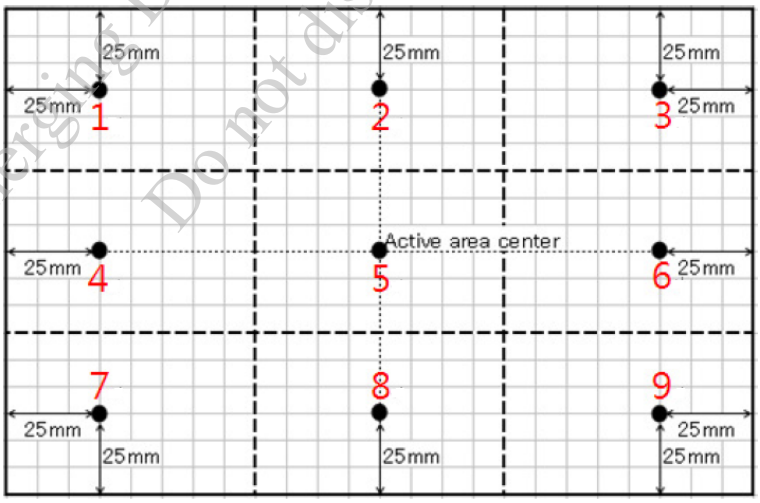




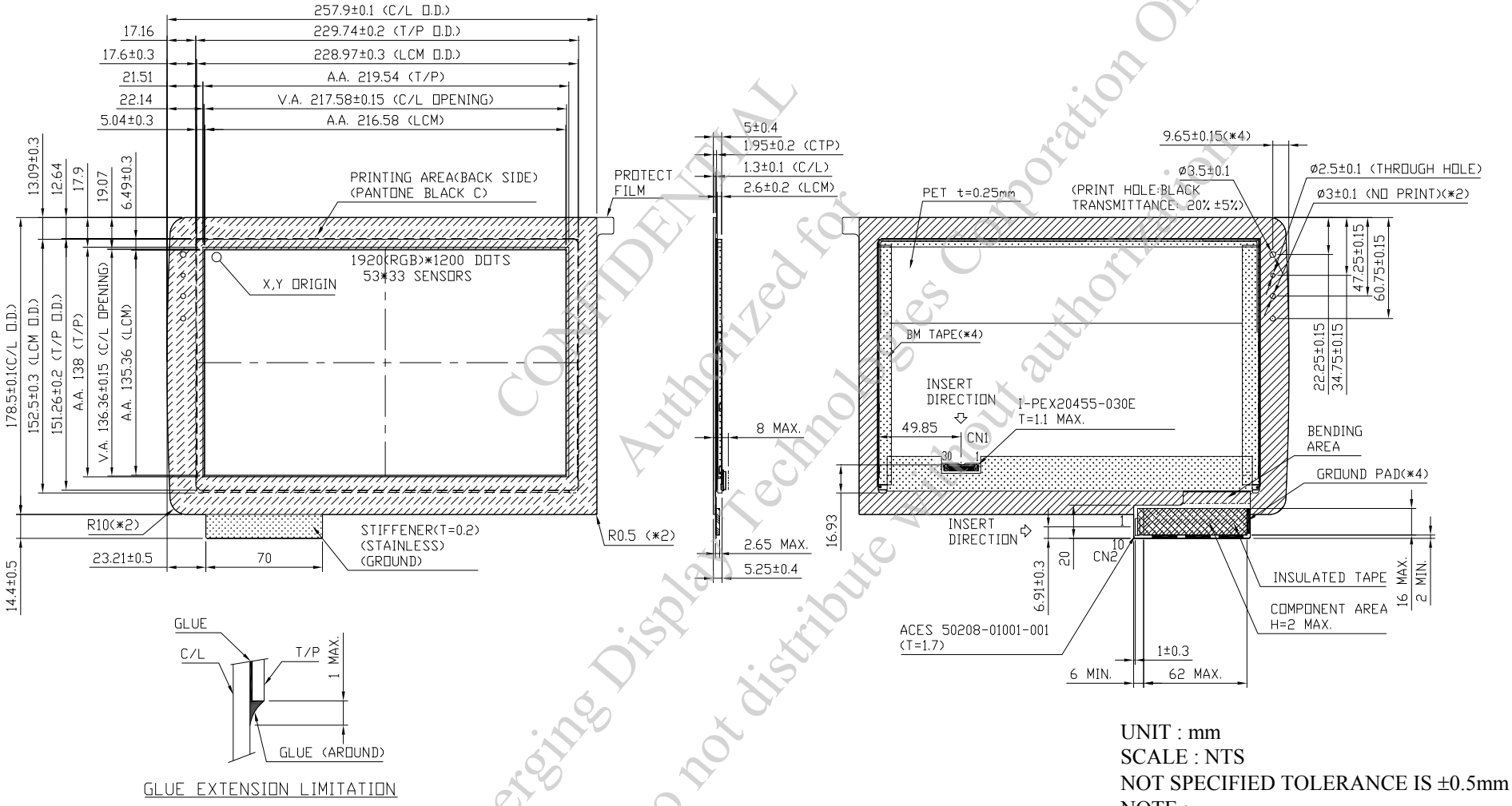
NOTE (4)：DEFINITION OF OPTICAL MEASUREMENT SETUP
COLOR COORDINATE AND COLOR GAMUT ARE MEASURED BY CA-310 OR EQUAL EQUIPMENT, AND ALL THE OTHER ITEMS ARE MEASURED BY CA-310(MINOLTA).
ALL THESE ITEMS ARE MEASURED UNDER TH DARK ROOM CONDITION (NO AMBIENT LIGHT). MEASUREMENT CONDITION: IL=21.7mA
THE LCD MODULE SHOULD BE TURN-ON TO A STABLE LUMINANCE LEVEL TO BE REACHED. THE MEASUREMENT SHOULD E EXECUTED AFTER LIGHTING BACKLIGHT FOR 10 MINUTES AND IN A DARK ROOM.



NOTE (5)：DEFINITION OF LUMINANCE AND LUMINANCE UNIFORMITY
CENTRAL LUMINANCE: THE WHITE LUMINANCE IS MEASURED AT THE CENTER POSITION “5” ON THE SCREEN.
9P UNIFORMITY: Δ L = (Lmin / Lmax) ×100%



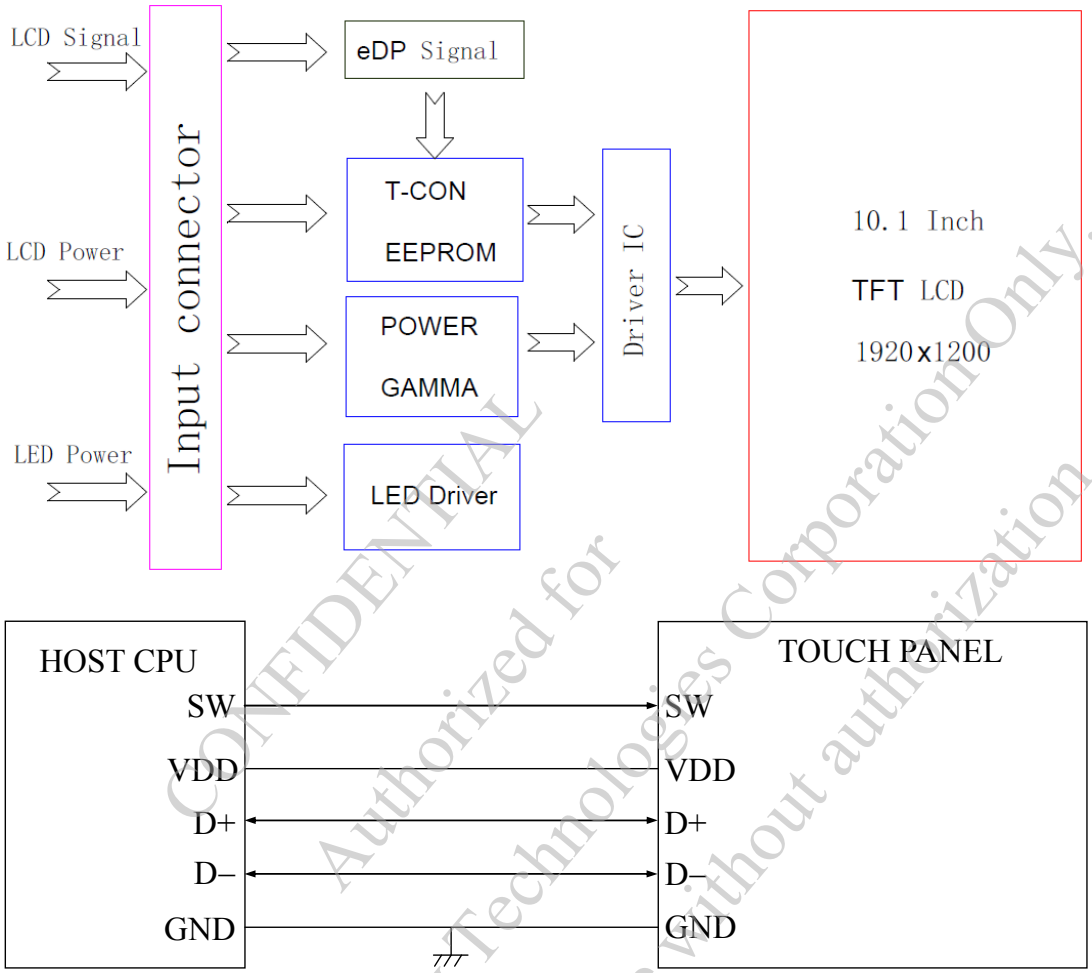
7. OUTLINE DIMENSIONS



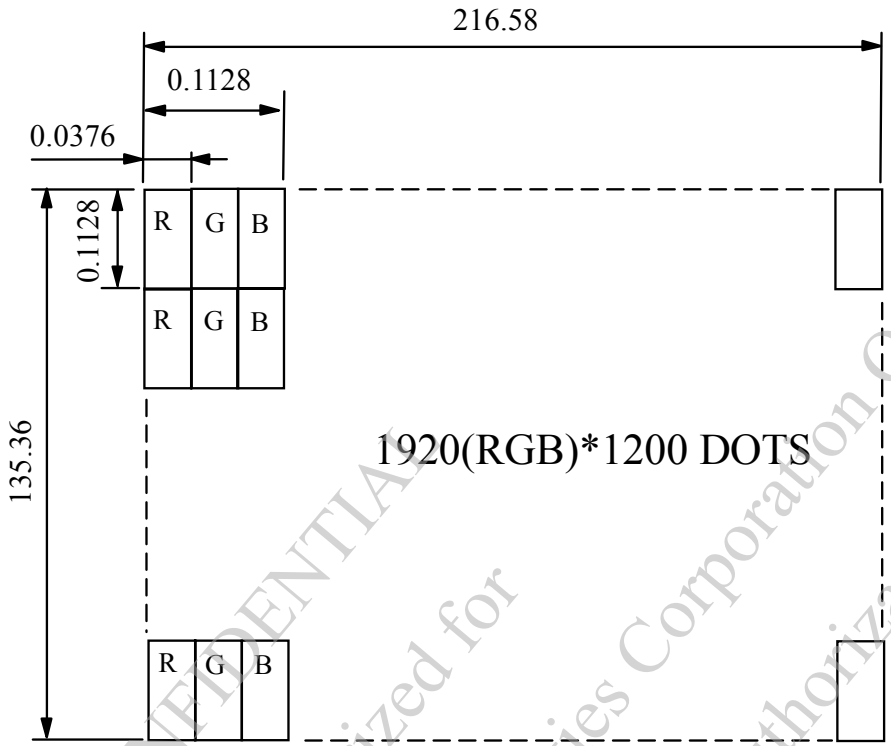
GLUE EXTENSION LIMITATION

UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.5mm
NOTE :
1.C/L GLASS : GORILLA

8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



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

10. INTERFACE SIGNALS

10.1 LCD MODULE INTERFACE

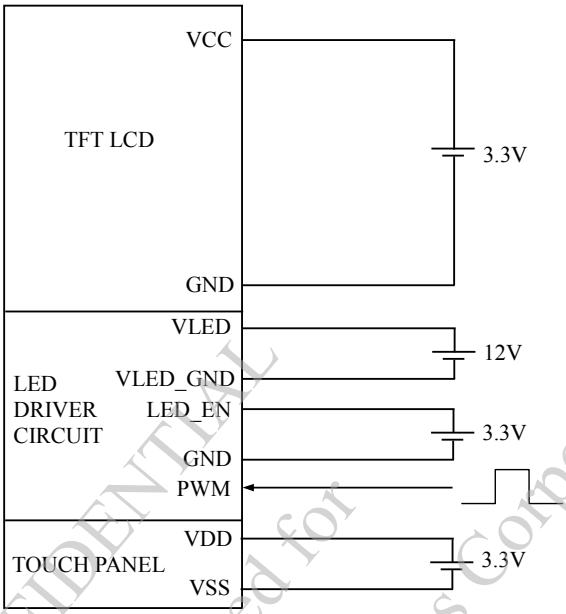
PIN NO.	SYMBOL	FUNCTION
1	NC	NOT CONNECT
2	H_GND	HIGH SPEED GROUND (0V)
3	Lane1_N	COMPLEMENT SIGNAL LINK LANE 1
4	Lane1_P	TRUE SIGNAL LINK LANE 1
5	H_GND	HIGH SPEED GROUND (0V)
6	Lane0_N	COMPLEMENT SIGNAL LINK LANE 0
7	Lane0_P	TRUE SIGNAL LINK LANE 0
8	H_GND	HIGH SPEED GROUND (0V)
9	AUX_CH_P	TRUE SIGNAL AUX CHANNEL
10	AUX_CH_N	COMPLEMENT SIGNAL AUX CHANNEL
11	H_GND	HIGH SPEED GROUND (0V)
12	VCC	POWER SUPPLY FOR LCD (3.3V)
13	VCC	
14	NC	NOT CONNECT
15	GND	GND (0V)
16	GND	GND (0V)
17	HPD	HOT PLUG DETECTION SIGNAL PIN (3.3V)
18	VLED-	GND (0V)
19	VLED-	
20	VLED-	
21	VLED-	
22	LED_EN	LED ENABLE
23	LED_PWM	PWM SIGNAL INPUT
24	NC	NOT CONNECT
25	NC	NOT CONNECT
26	VLED+	POWER SUPPLY FOR LED
27	VLED+	
28	VLED+	
29	VLED+	
30	GND	GND (0V)

10.2 TOUCH PANEL INTERFACE

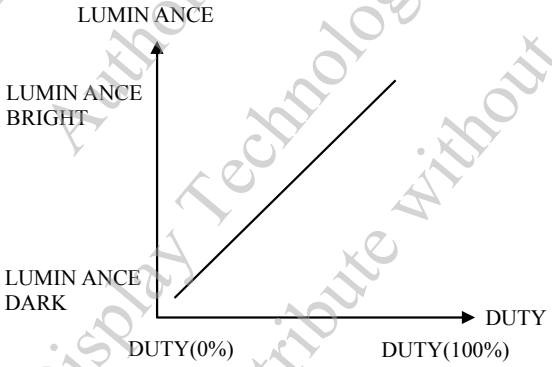
PIN NO.	SYMBOL	FUNCTION
1	VDD	POWER SUPPLY VOLTAGE (+3.3V)
2	NC	THE PIN WAS RESERVED FOR I2C_SCL PIN
3	NC	THE PIN WAS RESERVED FOR I2C_SDA PIN
4	NC	THE PIN WAS RESERVED FOR INT PIN
5	GND	GROUND
6	NC	THE PIN WAS RESERVED FOR RESET PIN
7	NC	THE PIN WAS RESERVED FOR TP_EN PIN
8	D+	USB D+
9	D–	USB D–
10	SW	MODE SWITCH PIN

11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM

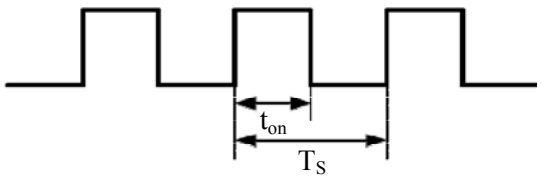


NOTE (1)：PWM ADJUST BRIGHTNESS TO CONTROL PIN, PULSE DUTY THE BIGGER THE BRIGHTER.



NOTE (2)：LED_EN SIGNAL=0~3.3V，OPERATION CONDITIONS：

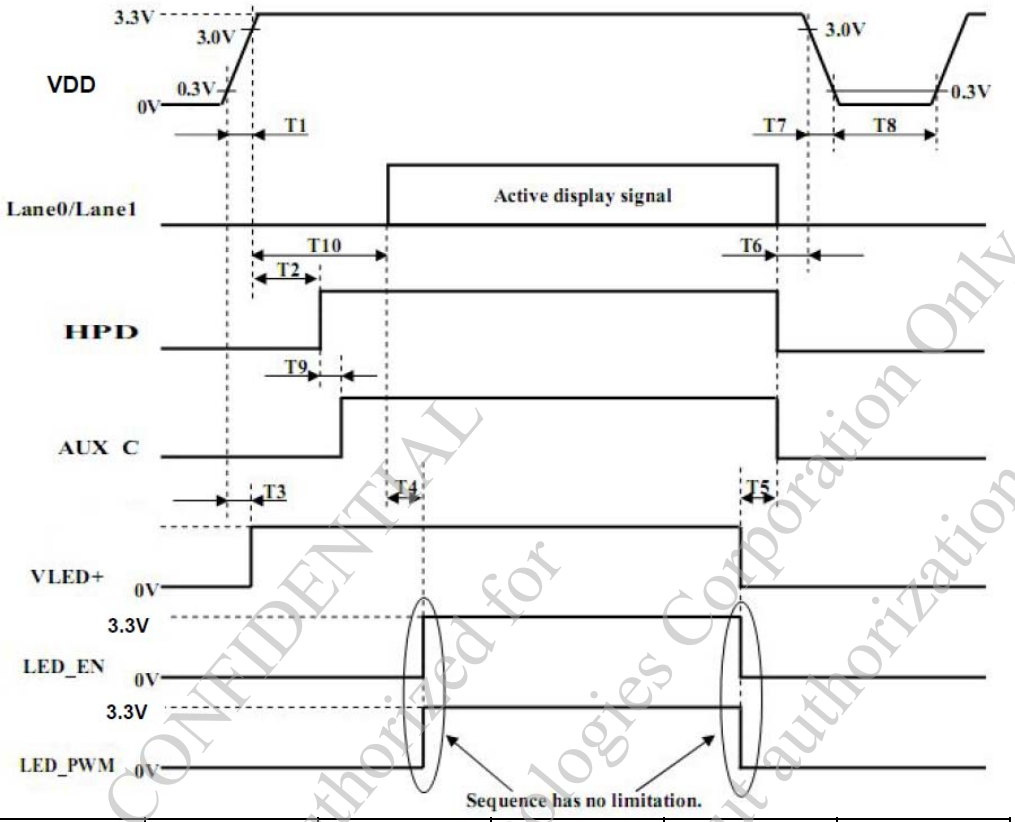
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED_EN&PWM LOGIC-HIGH LEVEL	V_{ADJH}	3.0	3.3	3.6	V	
LED_EN&PWM LOGIC-LOW LEVEL	VADJL	—	—	0.8	V	
DIMMING FREQUENCY	FADJ	0.075	—	2	kHz	



$D=t_{on}/T_S\times100\%$

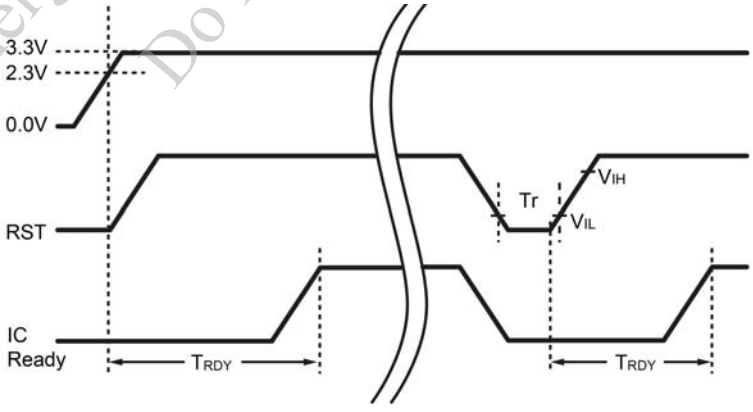
$F_{ADJ}=1/T_S$

11.2 POWER ON/OFF SEQUENCE FOR LCD MODULE



SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
T1	0.5	—	10	ms	
T2	—	160	180	ms	
T3	0	—	—	ms	
T4	0	—	—	ms	
T5	0	—	—	ms	
T6	0	—	—	ms	
T7	—	—	10	ms	
T8	500	—	—	ms	
T9	0	—	—	ms	
T10	260	—	—	ms	

11.3 POWER ON/OFF SEQUENCE FOR CTP MODULE



12. CAPACITIVE TOUCH PANEL SPECIFICATION

12.1 OPTICAL CHARACTERISTICS

ITEM	CONDITION	MIN.	TYP.	MAX.	UNIT
TRANSPARENCY NOTE (1)	Ta = 25°C λ=550nm	(85)	—	—	%

NOTE (1)：OPTICAL MEASUREMENT SHOULD BE EXECUTED AFTER PANEL IS SECURED. MEASUREMENT PROCESS SHOULD BE EXECUTED IN A STABLE, WINDLESS, AND DARK ROOM.
OPTICAL SPECIFICATIONS SHOULD BE MEASURED BY SPECTROPHOTOMETER.

12.2 HARDNESS

ITEM	DESCRIPTION
SURFACE HARDNESS	7H (min)

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

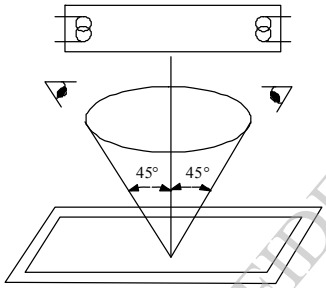
13.2 INSPECTION CONDITIONS

13.2.1 (1)OBSERVATION DISTANCE：45±5cm

(2)VIEW ANGLE：±45°

PERPENDICULAR TO MODULE SURFACE

VIEWING ANGLE SHOULD BE SMALLER THAN 45°



LINE OF SIGHT FOR INSPECTION SHALL BE WITHIN THE HALF SECTION OF THE VIEWING CONE GENERATED BY LINE SEGMENT 45° WITH RESPECTS TO THE VERTICAL AXIS FROM CENTER VERTEX OF LCD, THE CONE AXIS MUST BE PERPENDICULAR NORMAL TO LCD SURFACE AND PASSES THROUGH THE FLUORESCENT LAMP.

13.2.2 ENVIRONMENT CONDITIONS：

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

13.2.3 INSPECTION LOT

QUANTITY PER DELIVERY LOT FOR EACH MODEL

13.2.4 A SAMPLING INSPECTION SHALL BE MADE ACCORDING TO THE FOLLOWING PROVISIONS TO JUDGE THE ACCEPTABILITY

(a)APPLICABLE STANDARD：

MIL-STD-105E LEVEL II

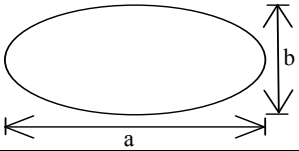
NORMAL INSPECTION, SINGLE SAMPLING

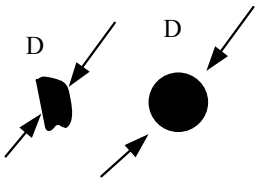
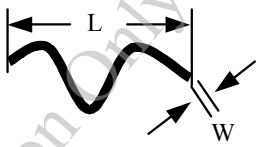
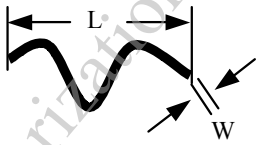
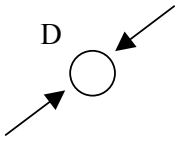
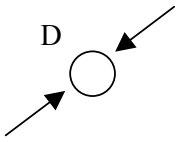
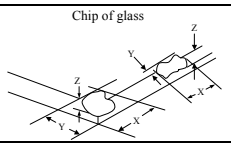
(b)AQL：MAJOR DEFECT：AQL 0.65

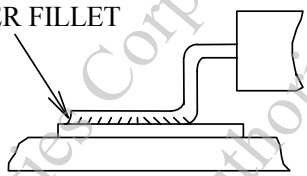
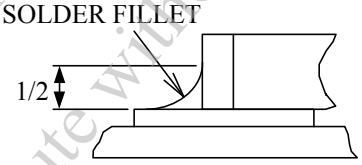
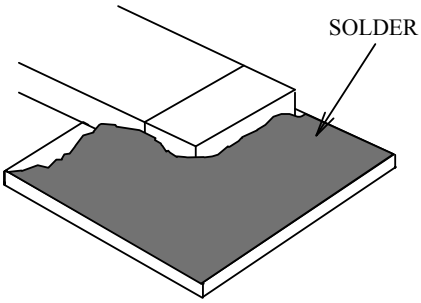
MINOR DEFECT：AQL 1.0

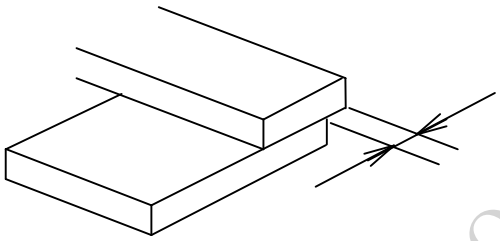
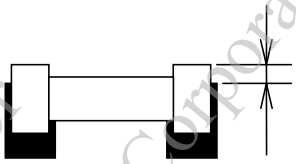
13.3 DEFECTS CLASSIFICATION

TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	DISPLAY ON	• DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS EX: DISCONNECTION, SHORT CIRCUIT ETC	0.65
	CTP FUNCTION	• NO FUNCTION • BROKEN LINE • FALSE TOUCH	
	BACKLIGHT	• NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION	
	DIMENSIONS	• SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS	
MINOR DEFECT	DISPLAY ZONE (VIEWING AREA)	• BLACK/WHITE SPOT / CIRCULAR TYPE • BUBBLES ON POLARIZER • NEWTON RING • BLACK/WHITE LINE / LINEAR TYPE • SCRATCH • CONTAMINATION • UNEVEN COLOR SPREAD	1.0
	BEZEL ZONE	• STAINS • SCRATCHES • FOREIGN MATTER	
	SOLDERING	• INSUFFICIENT SOLDER • SOLDERED IN INCORRECT POSITION • CONVEX SOLDERING SPOT • SOLDER BALLS • SOLDER SCRAPS	
	DISPLAY ON (ALL ON)	• LIGHT LINE	

<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>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 colspan="2">ITEM</th><th>ACCEPTABLE COUNT</th></tr>
<tr><td>BRIGHT DOT</td><td>RANDOM</td><td>N ≤ 5</td></tr>
<tr><td rowspan="2">DARK DOT</td><td>RANDOM</td><td>N ≤ 5</td></tr>
<tr><td>2 DOTS ADJACENT (PAIR)</td><td>N ≤ 5</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.
THE BRIGHT DOT DEFECT MUST BE VISIBLE THROUGH 5% ND FILTER.
(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>BUBBLES ON POLARIZER /SURFACE STAINS /DIRT/CF FAIL/SPOT</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 ≤ 0.1</td><td>IGNORE</td></tr>
<tr><td>0.1 < D ≤ 0.3</td><td>1</td></tr>
<tr><td>D > 0.3</td><td>0</td></tr>
<tr><td rowspan="2">SURFACE STAINS</td><td>D < 0.1</td><td>IGNORE</td></tr>
<tr><td>0.1 < D ≤ 0.5</td><td>N ≤ 6</td></tr>
<tr><td rowspan="2">CF FAIL / SPOT</td><td>D < 0.1</td><td>IGNORE</td></tr>
<tr><td>0.1 < D ≤ 0.2</td><td>N ≤ 1</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>
</table>

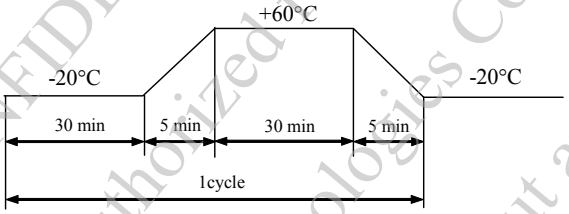
<table>
<tr><th>NO.</th><th>ITEM</th><th>CRITERIA</th></tr>
<tr><td>5</td><td>BLACK/WHITE SPOT/DENT CIRCULAR TYPE</td><td>THE FOLLOWING BLACK/WHITE SPOT ARE WITHIN THE VIEWING AREA. AVERAGE DIAMETER：D (mm)
<table><tr><th>SIZE D</th><th>PERMISSIBLE NO.</th></tr><tr><td>D≤0.25</td><td>IGNORE</td></tr><tr><td>0.25<D≤0.6</td><td>6</td></tr><tr><td>D>0.6</td><td>0</td></tr></table>NOTE (1)：THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</td><td>  </td></tr>
<tr><td>6</td><td>SCRATCH</td><td>THE FOLLOWING SCRATCH IS WITHIN THE VIEWING AREA. WIDTH：W (mm) , LENGTH : L (mm)
<table><tr><th>SIZE W & L</th><th>PERMISSIBLE NO.</th></tr><tr><td>W≤0.05</td><td>IGNORE</td></tr><tr><td>0.05≤W≤0.1, L≤12</td><td>6</td></tr><tr><td>W>0.1 OR L>12</td><td>0</td></tr></table>NOTE (1)：THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</td><td>  </td></tr>
<tr><td>7</td><td>BLACK / WHITE LINE LINEAR TYPE / FOREIGN FIBER</td><td>THE FOLLOWING BLACK LINE, WHITE LINE IS WITHIN THE VIEWING AREA. WIDTH：W (mm) , LENGTH : L (mm)
<table><tr><th>SIZE W & L</th><th>PERMISSIBLE NO.</th></tr><tr><td>W≤0.05</td><td>IGNORE</td></tr><tr><td>0.05≤W≤0.1, L≤12</td><td>6</td></tr><tr><td>W>0.1 OR L>12</td><td>0</td></tr></table>NOTE (1)：THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</td><td>  </td></tr>
<tr><td>8</td><td>BUBBLE / DENT FOR OPTICAL BONDING</td><td>BUBBLES WITHIN VIEWING AREA.
AVERAGE DIAMETER：D (mm)
<table><tr><th>SIZE D</th><th>PERMISSIBLE NO.</th></tr><tr><td>D≤0.25</td><td>IGNORE</td></tr><tr><td>0.25<D≤0.6</td><td>6</td></tr><tr><td>D>0.6</td><td>0</td></tr></table>NOTE (1)：THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</td><td>  </td></tr>
<tr><td>9</td><td>PIN HOLE / IMPURITIES ON PRINTING</td><td>AVERAGE DIAMETER：D (mm)
<table><tr><th>SIZE D</th><th>PERMISSIBLE NO.</th></tr><tr><td>D≤0.2</td><td>IGNORE</td></tr><tr><td>0.2<D≤0.4</td><td>6</td></tr><tr><td>D>0.4</td><td>0</td></tr></table>NOTE (1)：THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.
NOTE (2)：REFILL INK IS ACCEPTABLE, BUT LOGO AND ICON PIN HOLE ARE NOT ALLOWED.</td><td>  </td></tr>
<tr><td>10</td><td>CHIPPING</td><td><table><tr><td>CORNER</td><td>X ≤ 3mm、Y ≤ 3mm、Z ≤ t (t : THICKNESS)</td></tr><tr><td>EDGE</td><td>X ≤ 6mm , Y ≤ 1mm , Z < t (t : THICKNESS)</td></tr></table></td><td>  </td></tr>
<tr><td>11</td><td>CRACKED GLASS</td><td colspan="2">NOT ACCEPTABLE</td></tr>
<tr><td>12</td><td>LINE DEFECT ON DISPLAY</td><td colspan="2">OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOWED</td></tr>
<tr><td>13</td><td>MURA ON DISPLAY</td><td colspan="2">IT’S OK IF MURA IS SLIGHT VISIBLE THROUGH 5% ND FILTER</td></tr>
<tr><td>14</td><td>UNEVEN COLOR SPREAD, COLORATION</td><td colspan="2">TO BE DETERMINED BASED UPON THE LIMITED SAMPLE.</td></tr>
<tr><td>15</td><td>BEZEL APPEARANCE</td><td colspan="2">(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
16	PCB	(1)THERE MAY NOT BE MORE THAN 2mm OF SEALANT OUTSIDE THE SEAL AREA ON THE PCB, AND THERE SHOULD BE NO MORE THAN THREE PLACES. (2)NO OXIDATION OR CONTAMINATION PCB TERMINALS. (3)PARTS ON PCB MUST BE THE SAME AS ON THE PRODUCTION CHARACTERISTIC CHART. THERE SHOULD BE NO WRONG PARTS, MISSING PARTS OR EXCESS PARTS. (4)THE JUMPER ON THE PCB SHOULD CONFORM TO THE PRODUCT CHARACTERISTIC CHART. (5)IF SOLDER GETS ON BEZEL TAB PADS, LED PAD, ZEBRA PAD OR SCREW HOLD PAD; MAKE SURE IT IS SMOOTHED DOWN.
17	SOLDERING	(1)NO SOLDERING FOUND ON THE SPECIFIED PLACE (2)INSUFFICIENT 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
17	SOLDERING	(3)PARTS ALIGNMENT (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.
18	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.
19	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 BE 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.

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 +50°C FOR 240 hrs
2	LOW TEMPERATURE OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 0°C FOR 240 hrs
3	HIGH TEMPERATURE STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +60°C FOR 240 hrs
4	LOW TEMPERATURE STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -20°C FOR 240 hrs
5	HIGH TEMP / HUMIDITY TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 40°C, 90% RH 240 hrs
6	THERMAL SHOCK (NOT OPERATED)	THE SAMPLE SHOULD BE ALLOWED TO STAND THE FOLLOWING 100 CYCLES OF OPERATION: 
7	ESD (ELECTROSTATIC DISCHARGE) (NOT OPERATED)	AIR DISCHARGE ± 15KV, 10 TIMES CONTACT ± 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.

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 13.5, 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

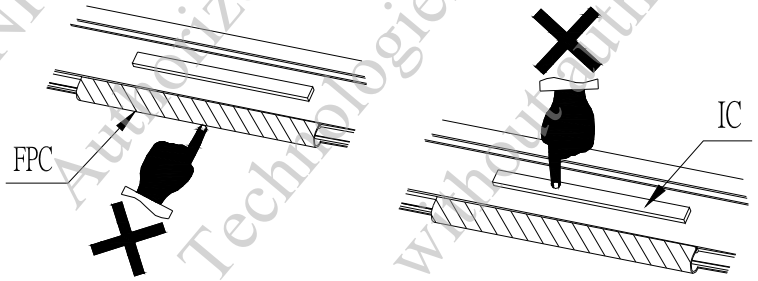
13.6.1 DO NOT CONNECT OR DISCONNECT MODULES TO OR FROM THE MAIN SYSTEM WHILE POWER IS BEING SUPPLIED .

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!



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 THETHROUGH-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.