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Vincent Wh		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

ETML070013DADH6

(RoHS)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO.	VERSION	PAGE
ETML070013DADH6	1	0-1

RECORDS OF REVISION	DOC. FIRST ISSUE	OCT.03, 2023
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DATE	REVISED PAGE NO.	SUMMARY
		<p style="text-align: center; opacity: 0.5;"> CONFIDENTIAL Authorized for Emerging Display Technologies Corporation Only. Do not distribute without authorization. </p>

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1. GENERAL SPECIFICATIONS

1.1 DATA SHEETS FOR CONTROLLER / DRIVER PLEASE REFER TO :

FITIPower EK79713BCGB
FITIPower EK73202AB2

1.2 DATA SHEET FOR CAPACITIVE TOUCH PANEL CONTROLLER/DRIVER
PLEASE REFER TO :

ILITEK ILI2118A

1.3 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), BIS(2-ETHYLHEXYL) PHTHALATE (DEHP), BUTYL BENZYL PHTHALATE (BBP), DIBUTYL PHTHALATE (DBP), DIISOBUTYL PHTHALATE (DIBP).

2. MECHANICAL SPECIFICATIONS

2.1 TFT LCD MODULE MECHANICAL SPECIFICATIONS

- (1) DISPLAY SIZE ----- 7 inch
- (2) NUMBER OF DOTS ----- 800(RGB)W * 480H DOTS
- (3) MODULE SIZE ----- 164.9W * 100.4H * 7.44D mm
(WITHOUT FPC)
- (4) VIEWING AREA ----- 156.08W * 88.53H mm
- (5) ACTIVE AREA ----- 154.08W * 85.92H mm
- (6) DOT SIZE ----- 0.0642W * 0.179H mm
- (7) PIXEL SIZE ----- 0.1926W * 0.179H mm
- (8) LCD TYPE ----- TFT, TN, TRANSMISSIVE, ANTE-GLARE
- (9) COLOR ----- 16.7M
- (10) VIEWING DIRECTION ----- 6 O'CLOCK (GRAY LEVEL INVERSION)
- (11) BACK LIGHT ----- LED , COLOR : WHITE
- (12) INTERFACE MODE ----- RGB 24BIT PARALLEL
(SYNC / DE MODE)
- (13) WEIGHT ----- 205g

2.2 CAPACITIVE TOUCH PANEL MECHANICAL SPECIFICATIONS

- (1) TOUCH PANEL SIZE ----- 7 inch
- (2) OUTER DIMENSION ----- 163.7W * 100.4H mm * 1.4D mm
(WITHOUT FPC)
- (3) ACTIVE AREA ----- 155.6W * 91.01H mm
- (4) INPUT TYPE ----- MULTI TOUCH
- (5) NUMBER OF TOUCH SENSOR ----- 28*16 SENSORS
- (6) RESOLUTION ----- 2048 * 2048
- (7) INTERFACE MODE ----- I2C
- (8) THE MATERIAL OF COVER LENS ----- GLASS

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3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

POWER SUPPLY VOLTAGE

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	-0.3	5	V	—
POWER DISSIPATION FOR LED BACKLIGHT	PD	—	3000	mW	—
FORWARD CURRENT FOR LED BACKLIGHT	ILED	—	210	mA	—

3.2 CAPACITIVE TOUCH PANEL ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD1-VSS1	-0.3	3.6	V	

3.3 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), (3)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	—	2.45 m/s ² (0.25 G)	—	11.76 m/s ² (1.2 G)	10~100 Hz XYZ DIRECTIONS 1 HR EACH
SHOCK	—	29.4 m/s ² (3 G)	—	490 m/s ² (50 G)	10 ms XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (1) : THE ABSOLUTE MAXIMUM RATINGS OF THIS PRODUCT SHOULD NOT BE EXCEEDED AT ANY TIME. IF THESE RATINGS ARE EXCEEDED, THE PRODUCT'S PERFORMANCE IS NOT GUARANTEED AND THE PRODUCT MAY EXPERIENCE PERMANENT DAMAGE.

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

NOTE (3) : Ta ≤ 50°C : 85%RH MAX. (48HRS MAX).

Ta > 50°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 85%RH AT 50°C(48HRS MAX).

4. ELECTRICAL CHARACTERISTICS

4.1 LCD MODULE ELECTRICAL CHARACTERISTICS

Ta = 25 °C

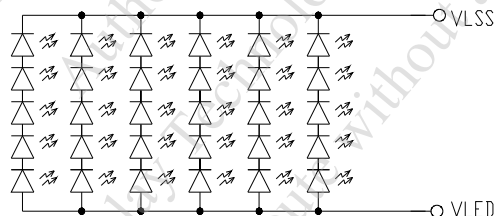
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	3.15	3.3	3.45	V	
LOGIC LOW INPUT VOLTAGE	VIL	—	VSS	—	0.3*VDD	V	
LOGIC HIGH INPUT VOLTAGE	VIH	—	0.7*VDD	—	VDD	V	
POWER SUPPLY CURRENT	IDD	VDD-VSS = 3.3V	—	100	130	mA	NOTE (1)
POWER SUPPLY VOLTAGE FOR LED BACKLIGHT	VLED-VLSS	ILED=180mA	15.5	16.25	17	V	NOTE (2)
LED LIFE TIME	—	IF=30mA (PER LED)	30K	—	—	HRS	NOTE (3) NOTE (4)

NOTE (1) : MAX. SPECIFICATION : WHITE TEST PATTERN.



WHITE TEST PATTERN

NOTE (2) : INTERNAL CIRCUIT DIAGRAM OF BACKLIGHT



NOTE (3) : CONDITIONS; Ta=25 °C, CONTINUOUS LIGHTING

NOTE (4) : DEFINITIONS OF LIFE TIME :

LCD LUMINANCE BECOMES HALF OF THE INITIAL VALUE.

4.2 CAPACITIVE TOUCH PANEL ELECTRICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE	VDD1-VSS1	—	3.15	3.30	3.45	V
LOGIC HIGH INPUT VOLTAGE	VIH	NOTE (1)	1	—	VDD1	V
LOGIC LOW INPUT VOLTAGE	VIL	—	VSS1	—	0.5	V
LOGIC HIGH OUTPUT VOLTAGE	VOH	—	—	NOTE (2)	—	V
LOGIC LOW OUTPUT VOLTAGE	VOL	—	VSS1	—	0.1	V
POWER SUPPLY CURRENT	IDD1	VDD1-VSS1 = 3.30V	—	85	120	mA

NOTE (1) : VIH INCLUDES PIN /RST, SDA, SCL, /INT.

NOTE (2) : VOH IS FOR /INT OUTPUT VOLTAGE LEVEL WHICH IS PROGRAMMABLE BY REGISTERS
TYPICAL VALUES ARE 1.2V/1.5V/1.8V/VVDD.

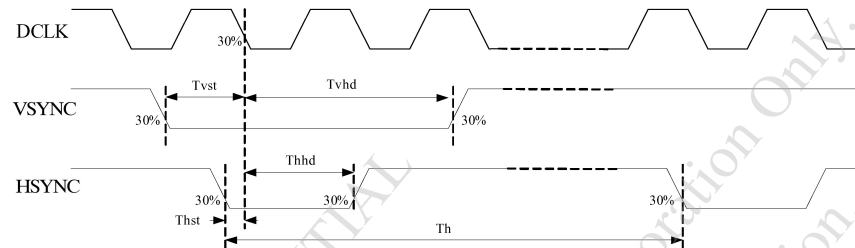
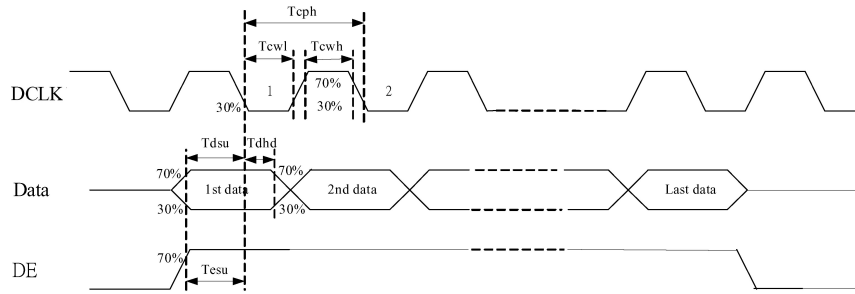
5. TIMING CHARACTERISTICS

5.1 FOR LCD MODULE

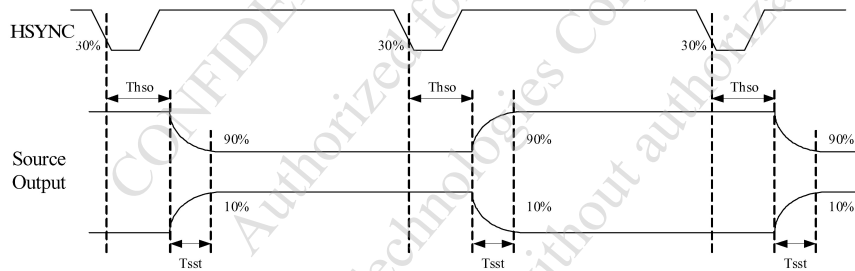
5.1.1 LCD MODULE AC ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
VDD POWER ON SLEW RATE	T _{POR}	1	10	20	ms	FROM 0V to 90% VDD
RESET PULSE WIDTH	T _{RST}	1	2	5	ms	Clkin=40MHz
DCLK CYCLE TIME	T _{cph}	20	30	40	ns	
DCLK PULSE DUTY	T _{cwh}	40	50	60	%	
VSYNC SETUP TIME	T _{vst}	8	10	20	ns	
VSYNC HOLD TIME	T _{vhd}	8	96000	64000	ns	
HSYNC SETUP TIME	T _{hst}	8	10	20	ns	
HSYNC HOLD TIME	T _{hhd}	8	120	800	ns	
DATA SETUP TIME	T _{dsu}	8	10	20	ns	D[7:0], D1[7:0], D2[7:0] to Clkin
DATA HOLD TIME	T _{dhd}	8	15	20	ns	D[7:0], D1[7:0], D2[7:0] to Clkin
DE SETUP TIME	T _{esu}	8	15	20	ns	
DE HOLD TIME	T _{ehd}	8	15	20	ns	
OUTPUT STABLE TIME	T _{sst}	—	—	6	us	10% TO 90% TARGET VOLTAGE. CL=120pF, R=10Kohm
DCLK CYCLE TIME	T _{clk}	20	30	40	ns	
DCLK PULSE DUTY	T _{cwh}	40	50	60	%	T _{clk}
TIME FROM HSYNC TO SOURCE OUTPUT	T _{hso}	—	64	—	DCLK	

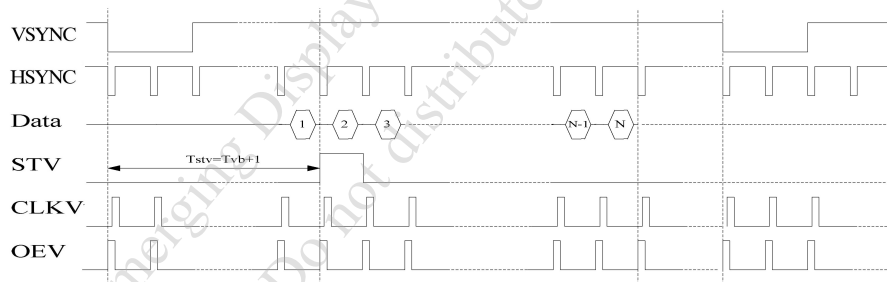
INPUT CLOCK AND DATA TIMING DIAGRAM



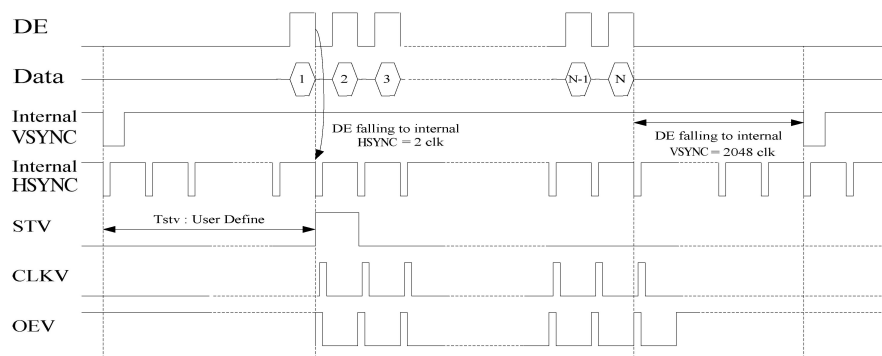
SOURCE OUTPUT TIMING DIAGRAM



VERTICAL TIMING DIAGRAM SYNC (TCON + SOURCE MODE)



VERTICAL TIMING DIAGRAM DE (TCON + SOURCE MODE)



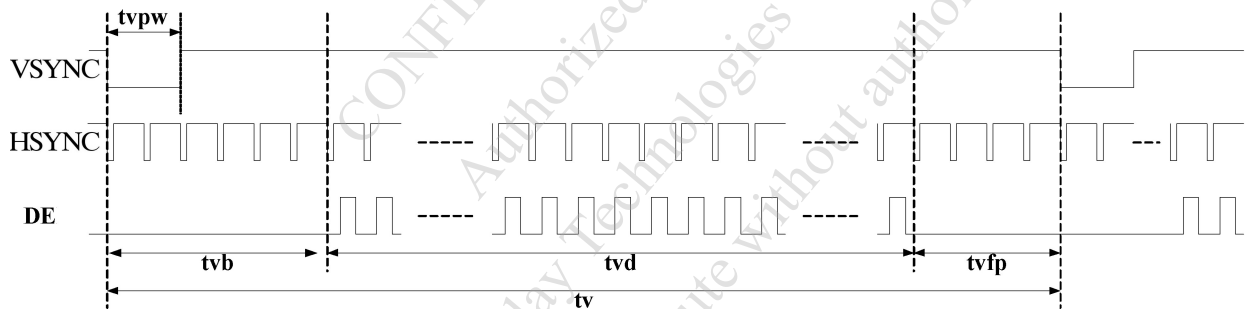
5.1.2 LCD MODULE TIMING CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
HORIZONTAL DISPLAY AREA	thd	800			DCLK	
DCLK FREQUENCY	fclk	26.4	33.3	46.8	MHz	
ONE HORIZONTAL LINE	th	862	1056	1200	DCLK	
HSYNC PULSE WIDTH	thpw	1	6	40	DCLK	NOTE (1)
HSYNC BACK PORCH (BLANKING)	thb	46			DCLK	NOTE (1)
HSYNC FRONT PORCH	thfb	16	210	354	DCLK	
DE MODE BLANKING	th-thd	62	256	400	DCLK	
VERTICAL DISPLAY AREA	tvd	480			H	
VSYNC PERIOD TIME	tv	510	525	650	H	
VSYNC PULSE WIDTH	tvpw	1	3	20	H	NOTE (2)
VSYNC BACK PORCH (BLANKING)	tvb	23			H	NOTE (2)
VSYNC FRONT PORCH	tvfb	7	22	147	H	
DE MODE BLANKING	tv-tvd	30	45	170	H	

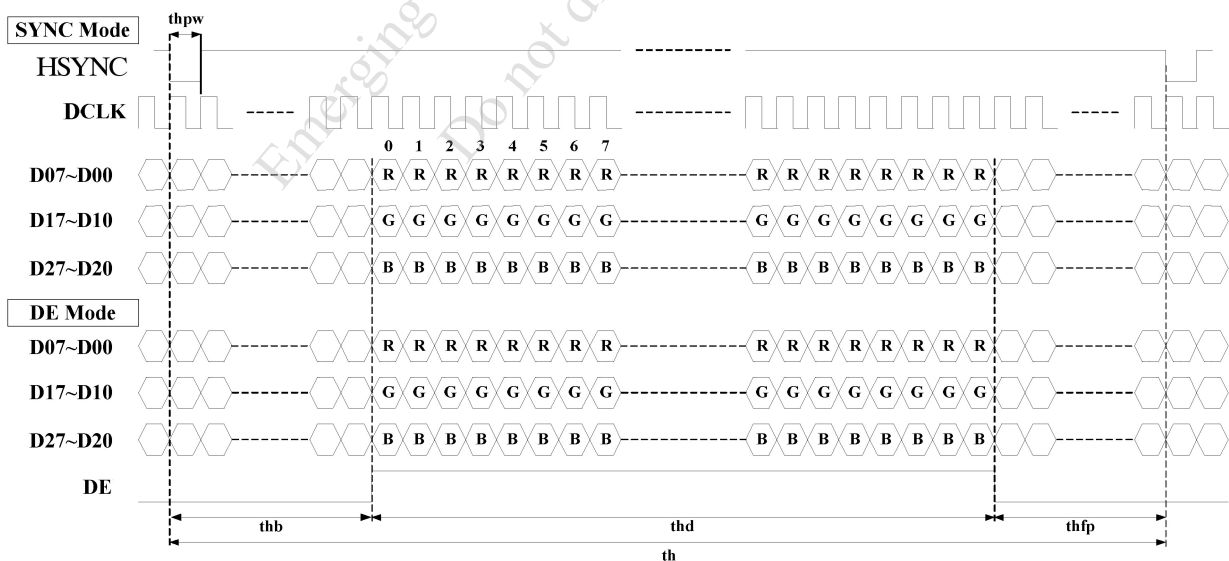
NOTE (1) : HS BLANKING HAS INCLUDED HS PULSE WIDTH.

NOTE (2) : VS BLANKING HAS INCLUDED VS PULSE WIDTH.

VERTICAL INPUT TIMING



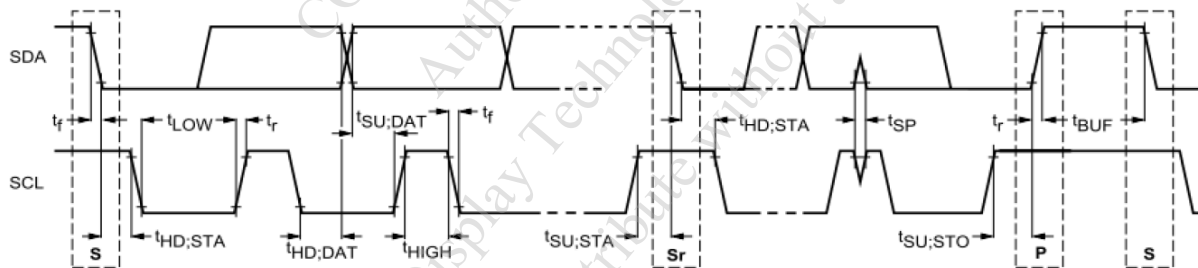
HORIZONTAL INPUT TIMING



5.2 FOR CTP MODULE

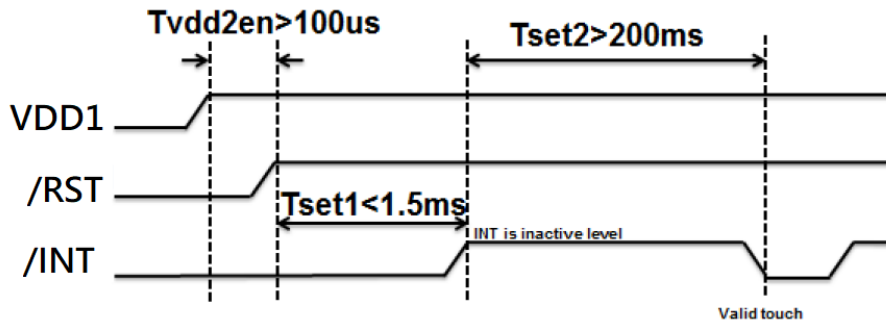
5.2.1 I2C INTERFACE TIMING CHARACTERISTICS

ITEM	SYMBOL	STANDARD MODE			FAST MODE		
		MIN.	MAX.	UNIT	MIN.	MAX.	UNIT
SCL CLOCK FREQUENCY	f_{SCL}	0	100	KHz	0	400	KHz
HOLD TIME (REPEATED) START CONDITION. AFTER THIS PERIOD, THE FIRST CLOCK PULSE IS GENERATED	$t_{HD;STA}$	4.0	—	μs	0.6	—	μs
LOW PERIOD OF THE SCL CLOCK	t_{LOW}	4.7	—	μs	1.3	—	μs
HIGH PERIOD OF THE SCL CLOCK	t_{HIGH}	4.0	—	μs	0.6	—	μs
SET-UP TIME FOR A REPEATED START CONDITION	$t_{SU;STA}$	4.7	—	μs	0.6	—	μs
DATA HOLD TIME	$t_{HD;DAT}$	0	3.45	μs	0	0.9	μs
DATA SET-UP TIME	$t_{SU;DAT}$	250	—	ns	100	—	ns
RISE TIME OF BOTH SDA AND SCL SIGNALS	t_r	—	1000	ns	—	300	ns
FALL TIME OF BOTH SDA AND SCL SIGNALS	t_f	—	300	ns	—	300	ns
SET-UP TIME FOR STOP CONDITION	$t_{SU;STO}$	4.0	—	μs	0.6	—	μs
BUS FREE TIME BETWEEN A STOP AND START CONDITION	t_{BUF}	4.7	—	μs	1.3	—	μs



THE TIMING OF I2C INTERFACE

5.2.2 POWER ON SEQUENCE

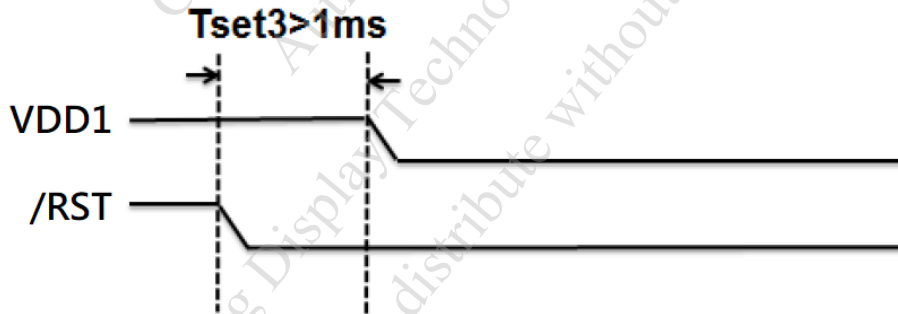


NOTE (1) : AFTER TP_RST SET TO HIGH, TP_INT REQUIRES T_{set1} TO SET TO INACTIVE STATE

NOTE (2) : THE TP_INT PIN CAN BE DEFINED BY TOUCH FIRMWARE DESIGN. IT CAN BE ACTIVE HIGH OR ACTIVE LOW.

ITEM	STANDARD MODE		UNIT
	MIN.	MAX.	
Tset1	—	1.5	ms
Tset2	200	—	ms
Tvdd2en	100	—	us

5.2.3 POWER OFF SEQUENCE



ITEM	STANDARD MODE		UNIT
	MIN.	MAX.	
Tset3	1	—	ms

6. OPTICAL CHARACTERISTICS (NOTE 1)

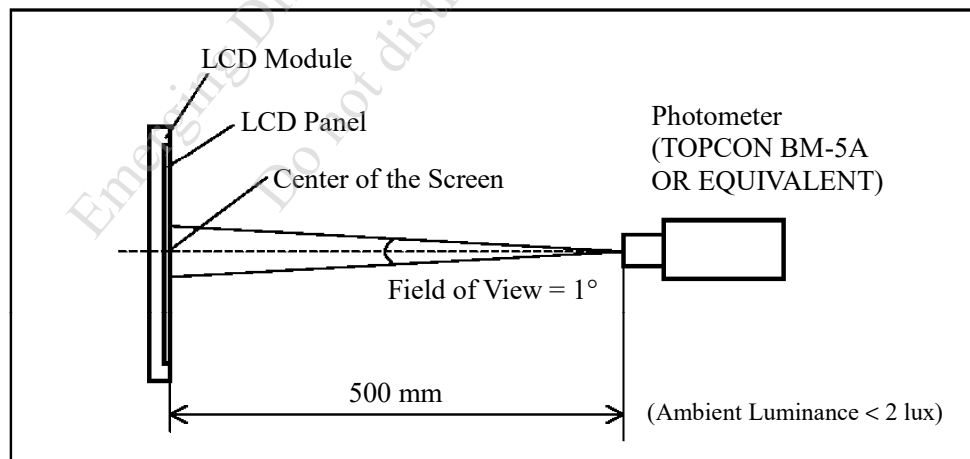
6.1 OPTICAL CHARACTERISTICS

Ta=25±2°C

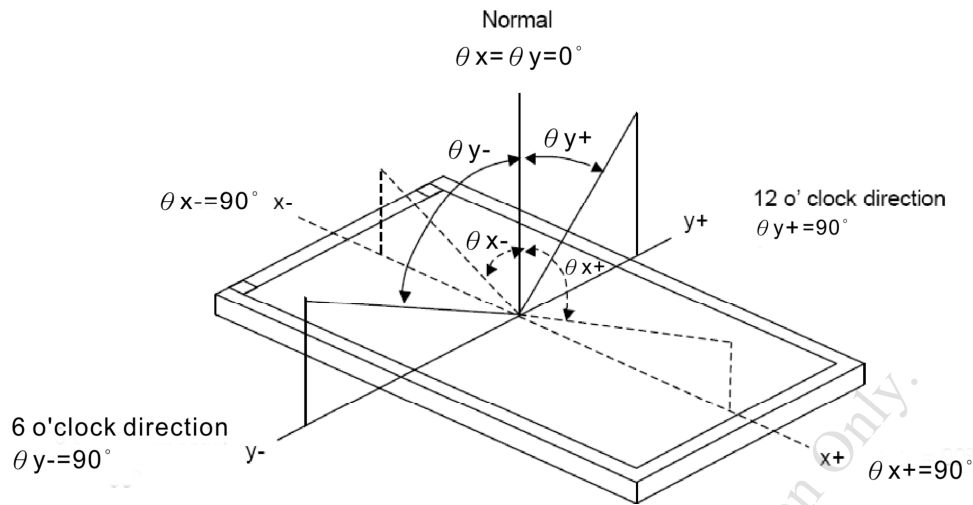
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK	
VIEWING ANGLE	θ_{y+}	CR ≥ 10	$\theta_x=0^\circ$	60	70	—	deg.	NOTE (2) NOTE (3)
	θ_{y-}			50	60	—		
	θ_{x+}		$\theta_y=0^\circ$	60	70	—		
	θ_{x-}			60	70	—		
CONTRAST RATIO (CENTER)	CR	$\theta_x=0^\circ, \theta_y=0^\circ$	400	500	—	—	NOTE (3)	
RESPONSE TIME	Tr + Tf		—	25	50	msec	NOTE (4)	
COLOR CHROMATICITY (CENTER)	WHITE	Wx	$\theta_x=0^\circ, \theta_y=0^\circ$ ILED=180mA	0.27	0.32	0.37	—	NOTE (5)
		Wy		0.30	0.35	0.40		
	RED	Rx		0.53	0.58	0.63	—	
		RY		0.29	0.34	0.39		
	GREEN	Gx		0.29	0.34	0.39	—	
		Gy		0.58	0.63	0.68		
	BLUE	Bx		0.10	0.15	0.20	—	
		By		0.04	0.09	0.14		
THE BRIGHTNESS OF MODULE (CENTER)	B	$\theta_x=0^\circ, \theta_y=0^\circ$ ILED=180mA	340	425	—	cd/m ²	NOTE (6)	
THE UNIFORMITY OF MODULE	—	$\theta_x=0^\circ, \theta_y=0^\circ$ ILED=180mA	70	75	—	%	NOTE (7)	

NOTE (1) : TEST CONDITION :

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.



NOTE (2) : DEFINITION OF VIEWING ANGLE :



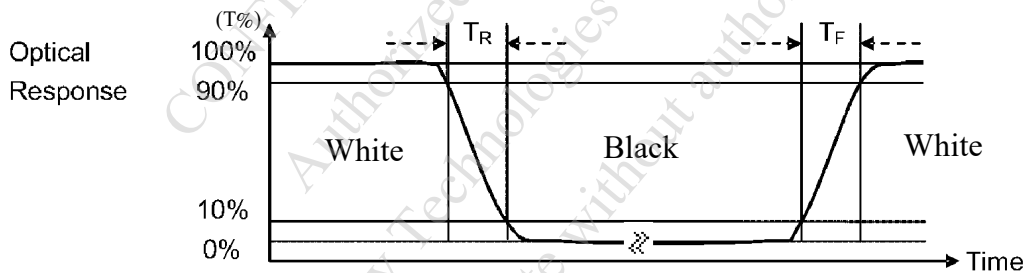
NOTE (3) : DEFINITION OF CONTRAST RATIO (CR) :

MEASURED AT THE CENTER POINT OF MODULE

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

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

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



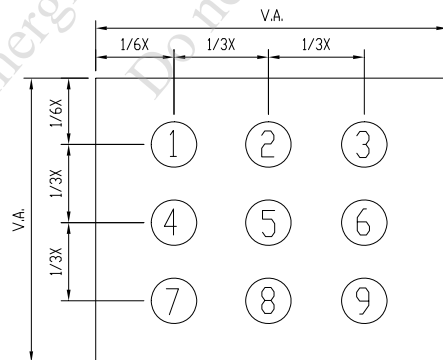
NOTE (5) : DEFINITION OF COLOR CHROMATICITY

(a) 100% RGB PIXEL DATA TRANSMISSION WHEN ALL THE INPUT TERMINALS OF MODULE ARE ELECTRICALLY POWERED ON.

(b) MEASURED AT THE CENTER POINT OF MODULE

NOTE (6) : MEASURED THE BRIGHTNESS OF WHITE STATE AT CENTER POINT.

NOTE (7) : (a) DEFINITION OF BRIGHTNESS UNIFORMITY

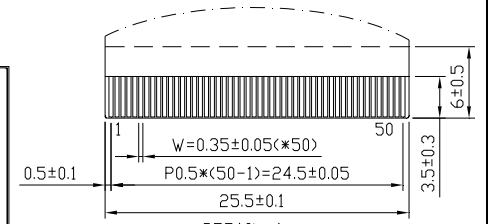
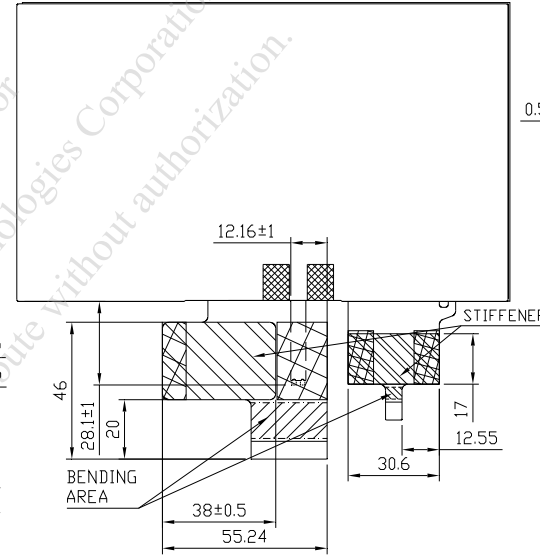
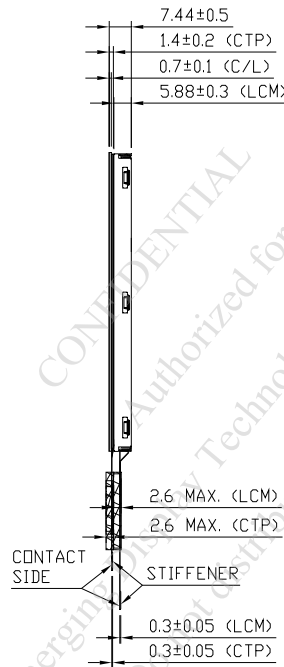
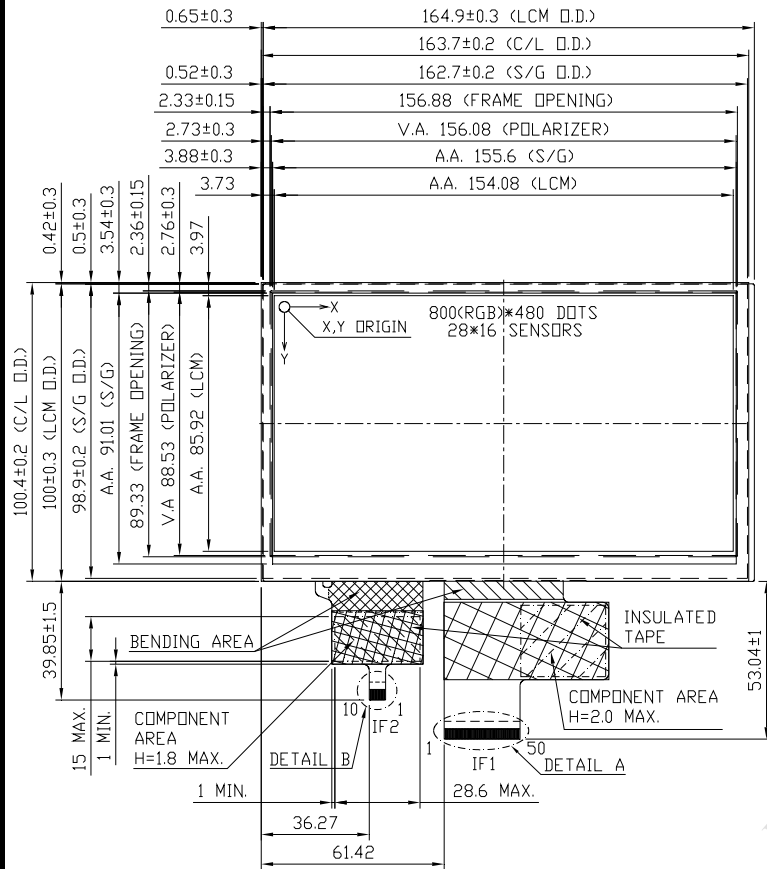


UNIT : mm

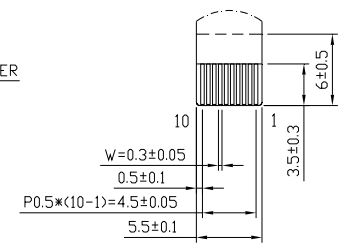
(b) THE BRIGHTNESS UNIFORMITY CALCULATING METHOD

$$\text{UNIFORMITY} : \frac{\text{MINIMUM BRIGHTNESS}}{\text{MAXIMUM BRIGHTNESS}} * 100\%$$

7. OUTLINE DIMENSIONS



IF1 DETAIL A
SCALE 4:1



IF2 DETAIL B
SCALE 4:1

VIEWING DIRECTION

Best Contrast but with Gray Level Inversion

UNIT : mm
SCALE : NTS

THIRD ANGLE PROJECTION

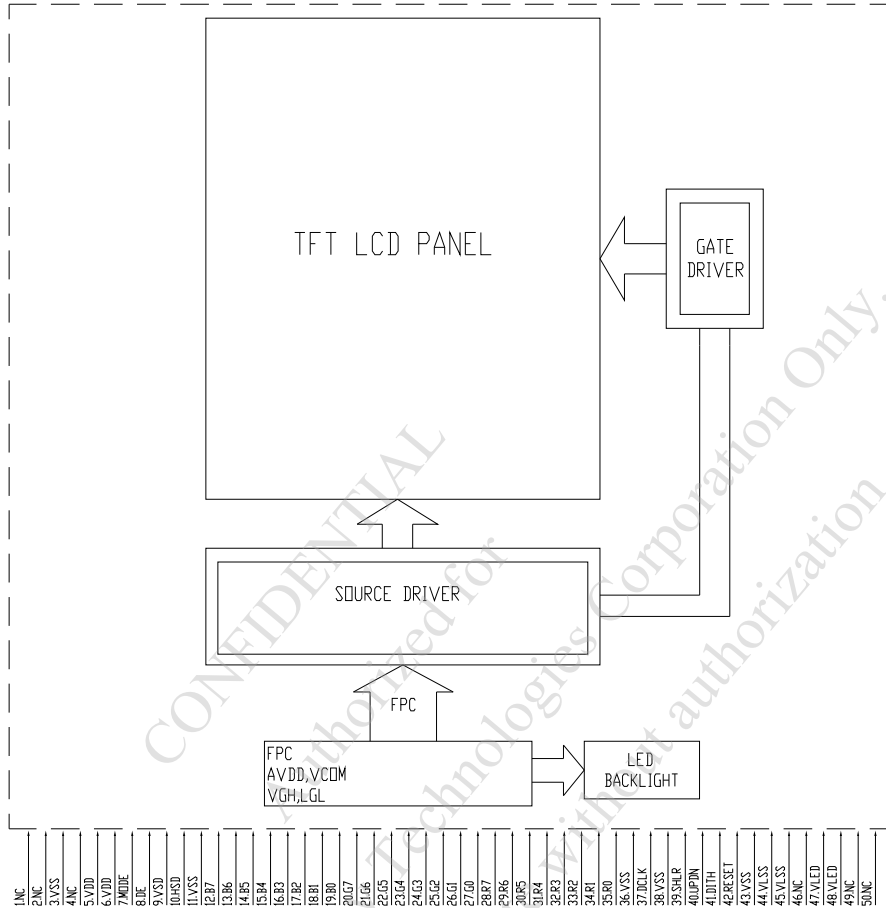
NOT SPECIFIED TOLERANCE IS ± 0.5

NOTE :

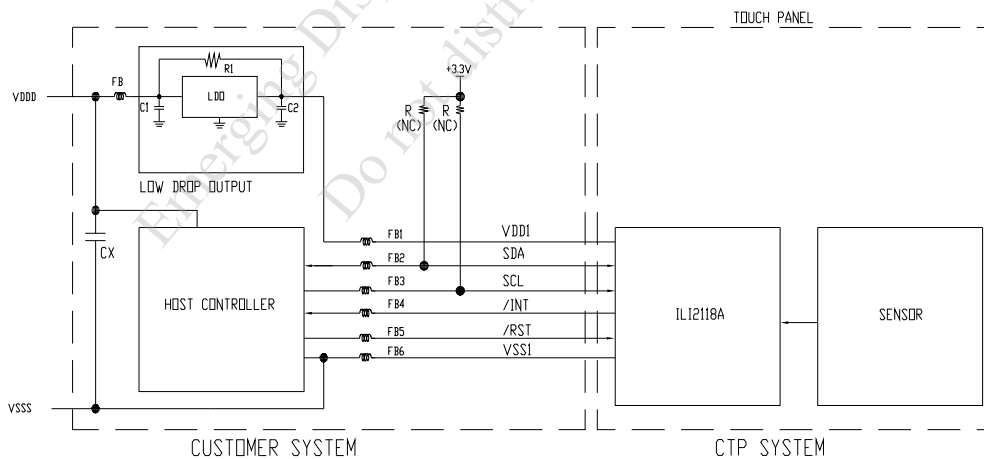
1. C/L GLASS : SODA LIME , NON-STRENGTHEN , NO CHAMFERED.
2. IF1: RECOMMEND MATCH CONNECTOR : KYOCERA 04 6240 050 SERIES.
IF2: RECOMMEND MATCH CONNECTOR : IMSA-9631S SERIES (10 PIN) .
3. FPC BENDING RADIUS SHOULD BE MORE THAN 1.0 mm.

8. BLOCK DIAGRAM

8.1 TFT



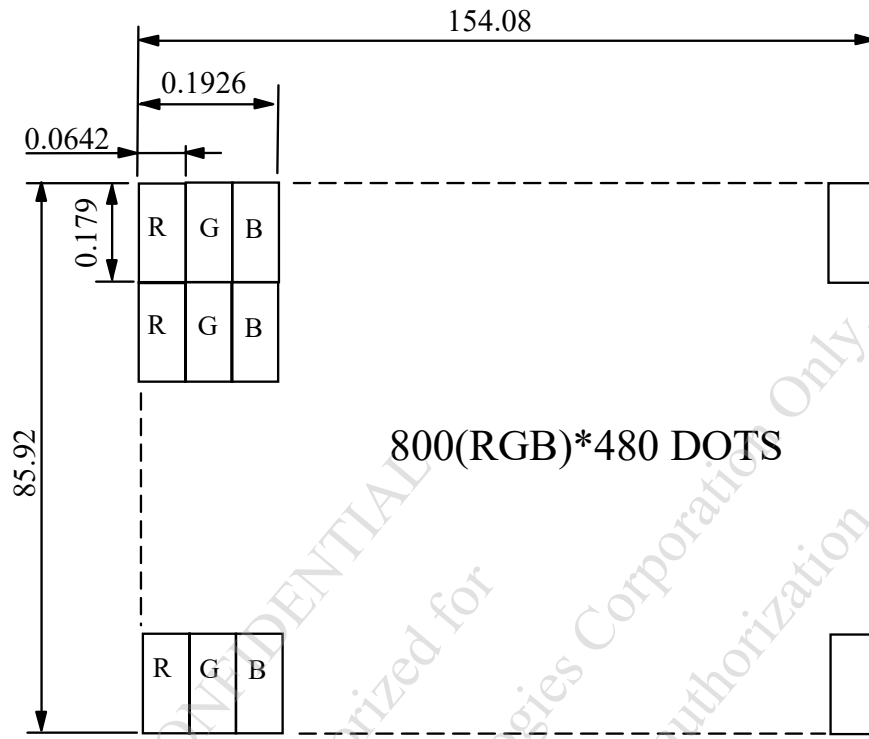
8.2 CTP



NOTE (1) : VALUE OF PULL-UP RESISTORS(R) DEPENDS ON CLOCK SPEED , NUMBER OF CHIPS ON THE I2C BUS AND NOISE LEVEL. LOW SPEED 4.7K TO 10K OR HIGHER, HIGH SPEED 1K TO 4.7K OR HIGHER. SIGNALS SHOULD BE MEASURED WITH AN OSCILLOSCOPE TO VERIFY WAVEFORM AND HIGH / LOW LEVELS.

NOTE (2) : POWER SUPPLY SHALL BE CLEAN AND NOISE FREE. ADDITIONAL FILTERING OR A SEPARATE LDO (LOW DROP OUT) REGULATOR CAN BE REQUIRED. C1 AND C2 CAPACITORS RECOMMENDATION : 4.7 μ F OR 10 μ F.

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

10.1 IF1

PIN NO.	SYMBOL	I/O/P	FUNCTION
1	NC	P	NON ONNECTION
2	NC	P	NON ONNECTION
3	VSS	P	POWER GROUND
4	NC	P	NON ONNECTION
5	VDD	P	POWER GROUND
6	VDD	P	POWER SUPPLY
7	MODE	I	DE/SYNC MODE SELECT. NORMALLY PULL HIGH H: DE MODE. L: HSD/VSD MODE
8	DE	I	DATA INPUT ENABLE
9	VSD	I	VERTICAL SYNC INPUT. NEGATIVE POLARITY
10	HSD	I	HORIZONTAL SYNC INPUT. NEGATIVE POLARITY
11	VSS	P	POWER GROUND
12	B7	I	BLUE DATA(MSB)
13	B6	I	BLUE DATA
14	B5	I	BLUE DATA
15	B4	I	BLUE DATA
16	B3	I	BLUE DATA
17	B2	I	BLUE DATA
18	B1	I	BLUE DATA
19	B0	I	BLUE DATA(LSB)
20	G7	I	GREEN DATA(MSB)
21	G6	I	GREEN DATA
22	G5	I	GREEN DATA
23	G4	I	GREEN DATA
24	G3	I	GREEN DATA
25	G2	I	GREEN DATA
26	G1	I	GREEN DATA
27	G0	I	GREEN DATA(LSB)
28	R7	I	RED DATA(MSB)
29	R6	I	RED DATA
30	R5	I	RED DATA
31	R4	I	RED DATA
32	R3	I	RED DATA
33	R2	I	RED DATA
34	R1	I	RED DATA
35	R0	I	RED DATA(LSB)
36	VSS	P	POWER GROUND
37	DCLK	I	CLOCK INPUT
38	VSS	P	POWER GROUND
39	SHLR	I	LEFT OR RIGHT DISPLAY CONTROL
40	UPDN	I	UP / DOWN DISPLAY CONTROL

PIN NO.	SYMBOL	I/O/P	FUNCTION
41	DITH	I	DITHERING SETTING DITH=" H " 6BIT RESOLUTION (LAST 2 BIT OF INPUT DATA TRUNCATED) DITH=" L " 8BIT RESOLUTION (DEFAULT SETTING)
42	RESET	I	GLOBAL RESET PIN. ACTIVE LOW TO ENTER RESET STATE. SUGGEST TO CONNECTING WITH AN RC RESET CIRCUIT FOR STABILITY. NORMALLY PULL HIGH. (R=10KΩ, C=1μF)
43	VSS	P	POWER GROUND
44	VLSS	P	LED BACKLIGHT GROUND
45	VLSS	P	LED BACKLIGHT GROUND
46	NC	P	NON ONNECTION
47	VLED	P	POWER SUPPLY VOLTAGE FOR LED BACKLIGHT
48	VLED	P	POWER SUPPLY VOLTAGE FOR LED BACKLIGHT
49	NC	P	NON ONNECTION
50	NC	P	NON ONNECTION

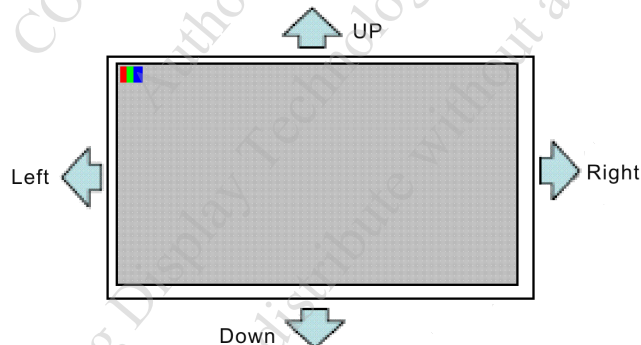
NOTE (1) : SHLR : LEFT OR RIGHT SETTING

UPDN : UP OR DOWN SETTING

SHLR	UPDN	DATA SHIFTING
VDD	VSS	LEFT TO RIGHT, UP TO DOWN (DEFAULT)
VSS	VSS	RIGHT TO LEFT, UP TO DOWN
VDD	VDD	LEFT TO RIGHT, DOWN TO UP
VSS	VDD	RIGHT TO LEFT, DOWN TO UP

NOTE (2) : DEFINITION OF SCANNING DIRECTION.

REFER TO THE FIGURE AS BELOW :

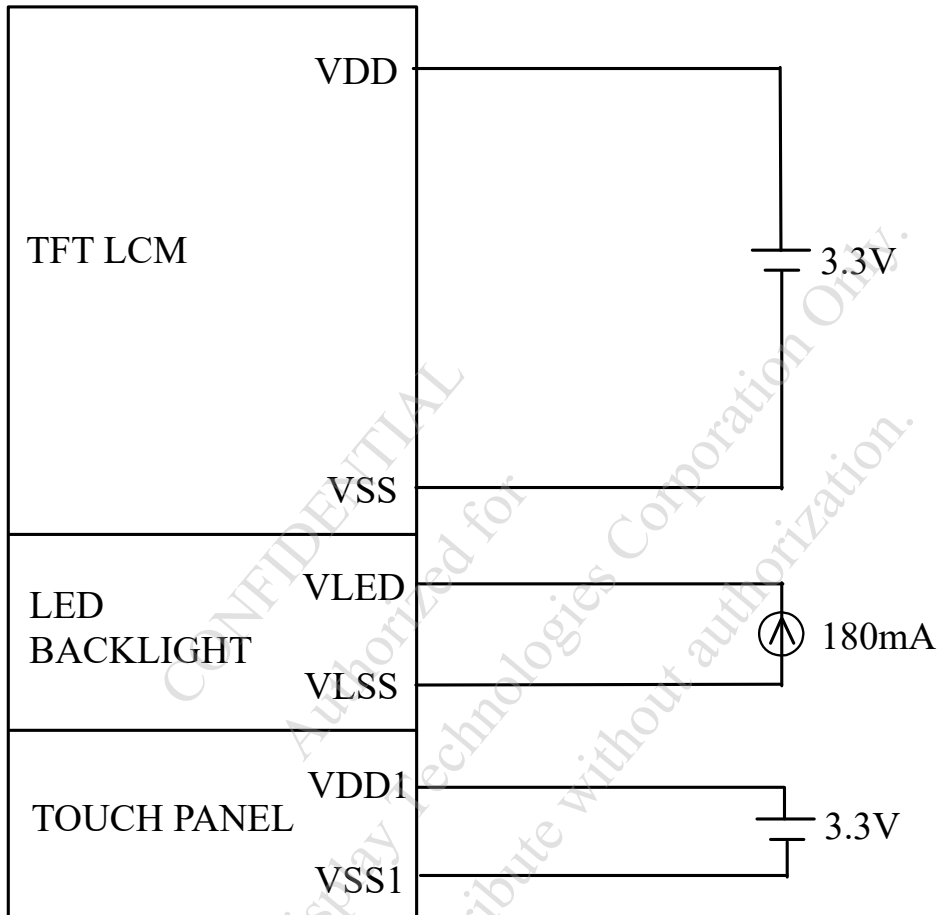


10.2 IF2

PIN NO.	SYMBOL	FUNCTION
1	VSS1	GROUND
2	/RST	EXTERNAL RESET, LOW IS ACTIVE
3	/INT	EXTERNAL INTERRUPT TO THE HOST
4	SCL	I2C CLOCK INPUT
5	SDA	I2C DATA INPUT AND OUTPUT
6	VDD1	POWER SUPPLY VOLTAGE
7	NC	NON CONNECTION
8	NC	NON CONNECTION
9	NC	NON CONNECTION
10	NC	NON CONNECTION

11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



12. CAPACITIVE TOUCH PANEL SPECIFICATION

12.1 OPTICAL CHARACTERISTICS

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

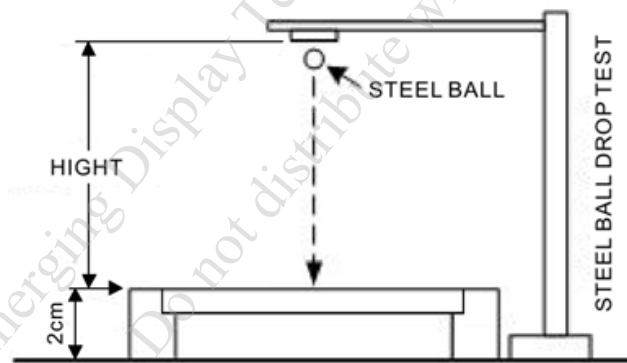
12.2 HARDNESS

ITEM	DESCRIPTION
SURFACE HARDNESS	7H (MIN.)

12.3 DURABILITY

USING STEEL BALL AND FALLING ON TOUCH PANEL SURFACE, FROM THE HEIGHT MUST PASS BELOW CONDITIONS :

ITEM	CONDITION	INSPECTION METHOD	DESCRIPTION
STEEL BALL DROP TEST	WEIGHT : 67g HEIGHT OF FALL : 30 cm	VISUAL INSPECTION	SIGN OF FRACTURE OR DAMAGE IS NOT ACCEPTABLE 3 TIME/ 1 POINTS, 25°C (CENTER POINT)



12.4 I2C INTERFACE DATA STRUCTURE

DEVICE ADDRESS

THE DEVICE ADDRESSES ARE 7-BINARY BITS LONG AND ARE CONVENTIONALLY EXPRESSED AS 4 BITS FOLLOWED BY 3 BITS FOLLOWED BY THE LETTER 'b', 0100 110b. THESE ADDRESSES OCCUPY THE HIGH SEVEN BITS OF AN EIGHT-BIT FIELD ON THE BUS.

MSB							LSB
0	1	0	0	1	1	0	0/1
Device Address							R/W

7-BIT DEVICE ADDRESS:
0x26

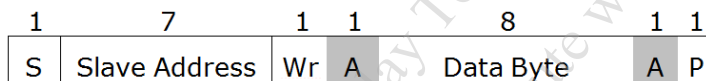
8-BIT DEVICE READ
ADDRESS:0x4D

8-BIT DEVICE WRITE
ADDRESS:0x4c

I2C DEVICE ADDRESS

DATA TRANSFER

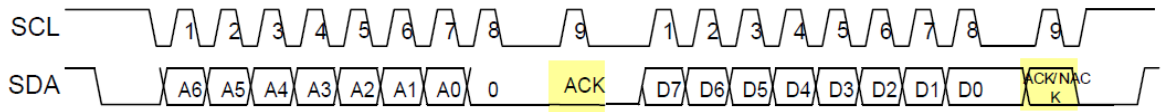
DATA IS TRANSFERRED OVER THE I²C BUS WITH 8-BIT ADDRESS AND 8-BIT DATA. THE RELATED PROTOCOL AND TIMING DIAGRAMS ARE SHOWN AS BELOW.



- S START CONDITION
 - Sr REPEATED START CONDITION
 - Rd READ (BIT VALUE OF 1)
 - Wr WRITE (BIT VALUE OF 0)
 - A ACKNOWLEDGE (THIS BIT POSITION MAY BE '0' FOR AN ACK OR '1' FOR A NACK)
 - P STOP CONDITION
- | | |
|-----|-----------------|
| | MASTER-TO-SLAVE |
| | SLAVE-TO-MASTER |
| --- | CONTINUE |

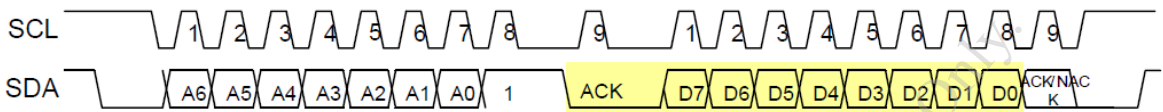
GENERIC TRANSACTION DIAGRAM

I2C WRITE TIMING



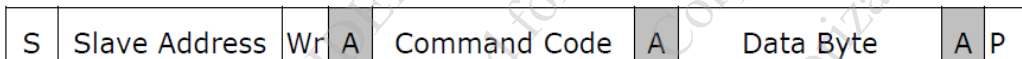
=> slave to master

I2C READ TIMING



=> slave to master

BYTE WRITE

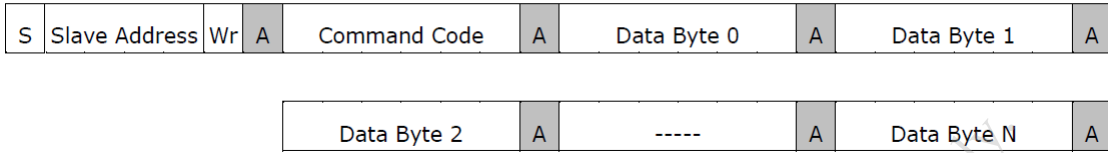
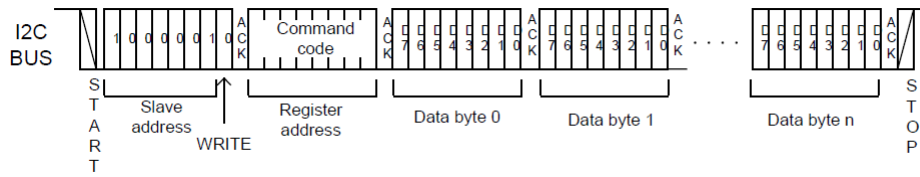


BYTE READ

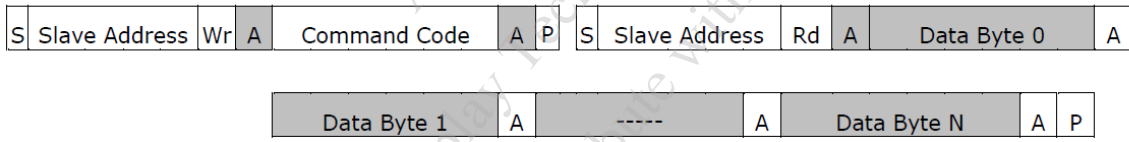
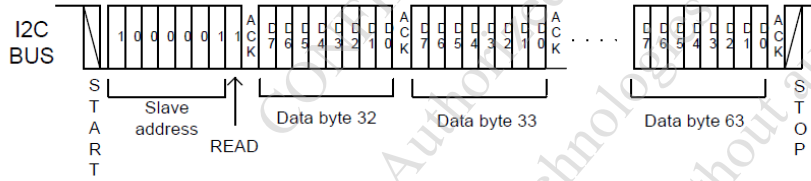
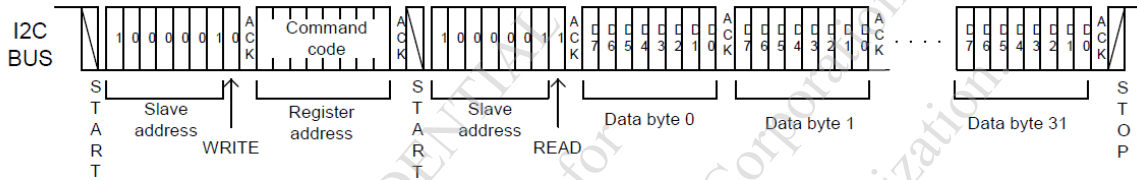


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 Do not distribute without authorization.

MULTI-BYTE WRITE



MULTI-BYTE READ



CONFIDENTIAL
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 Do not distribute without authorization

12.5 COMMUNICATION PROTOCOL

COMMAND LIST

NAME	DESCRIPTION
READ FIRMWARE INFORMATION	READ FIRMWARE INFORMATION

NOTICE: AFTER HOST WRITES OR READ I2C COMMAND PLEASE DELAY 1ms.

S	Slave Address	Wr	A	Data Byte	A	P	S	Slave Address	Wr	A	Data Byte	A
---	---------------	----	---	-----------	---	---	---	---------------	----	---	-----------	---



12.6 PROTOCOL DATA FORMAT

READ FIRMWARE INFORMATION

THE HOST SENDS I2C “MULTI-BYTE READ” FORMAT WITH COMMAND CODE “0x03” TO READ TOUCH FIRMWARE INFORMATION.

THE TOUCH DEVICE RESPONDS DATA WITH FOLLOWING DATA FORMAT.

BYTE	NAME OF BYTES	DESCRIPTION
0	Par 0	VENDER_ID
1	Par 1	RESERVED
2	Par 2	FIRMWARE VERSION: Par_2.Par_3
3	Par 3	
4	Par 4	RESERVED
5	Par 5	
6	Par 6	
7	Par 7	

12.7 DATA REPORT

ILI2118A USE INTERRUPT PIN TO SIGNAL THE HOST WHEN DETECTING TOUCH EVENTS ON THE SENSOR. WHEN A FINGER TOUCHES ON THE SENSOR SURFACE, THE TP_INT PIN WILL BE ACTIVE HIGH. THE WILL BE ENABLED AFTER EN PIN PULL HIGH 300ms

THE TP_INT PIN CAN BE DEFINED BY TOUCH FIRMWARE DESIGN. IT CAN BE ACTIVE HIGH OR ACTIVE LOW.

REPORT FORMAT

THE HOST SENDS I2C “MULTI-BYTE READ” FORMAT AFTER TOUCH DEVICE ISSUES INT TO READ TOUCH REPORTED DATA. THE TOUCH RESOLUTION IS 2048 X 2048.

THE TOUCH DEVICE RESPONDS DATA WITH THE FOLLOWING DATA FORMAT. TOUCH COORDINATE DATA IS 0xFF, IT MEANS THERE IS NO TOUCH.

BYTE	NAME OF BYTES	DESCRIPTION	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
0	Packet ID	0x5A								
1	X00 HIGH COORDINATE Y00 HIGH COORDINATE	X00[11:8] Y00[11:8]	X00[11:8]=Bit[7:4] Y00[11:8]=Bit[3:0]							
2	X00 LOW COORDINATE	X00[7:0]								
3	Y00 LOW COORDINATE	Y00[7:0]								
4	RESERVED	RESERVED								
5	X01 HIGH COORDINATE Y01 HIGH COORDINATE	X01[11:8] Y01[11:8]	X01[11:8]=Bit[7:4] Y01[11:8]=Bit[3:0]							
6	X01 LOW COORDINATE	X01[7:0]								
7	Y01 LOW COORDINATE	Y01[7:0]								
8	RESERVED	RESERVED								
9	X02 HIGH COORDINATE Y02 HIGH COORDINATE	X02[11:8] Y02[11:8]	X02[11:8]=Bit[7:4] Y02[11:8]=Bit[3:0]							
10	X02 LOW COORDINATE	X02[7:0]								
11	Y02 LOW COORDINATE	Y02[7:0]								
12	RESERVED	RESERVED								
13	X03 HIGH COORDINATE Y03 HIGH COORDINATE	X03[11:8] Y03[11:8]	X03[11:8]=Bit[7:4] Y03[11:8]=Bit[3:0]							
14	X03 LOW COORDINATE	X03[7:0]								
15	Y03 LOW COORDINATE	Y03[7:0]								

BYTE	NAME OF BYTES	DESCRIPTION	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0	
16	RESERVED	RESERVED									
17	X04 HIGH COORDINATE Y04 HIGH COORDINATE	X04[11:8] Y04[11:8]	X04[11:8]=Bit[7:4] Y04[11:8]=Bit[3:0]								
18	X04 LOW COORDINATE	X04[7:0]									
19	Y04 LOW COORDINATE	Y04[7:0]									
20	RESERVED	RESERVED									
21	X05 HIGH COORDINATE Y05 HIGH COORDINATE	X05[11:8] Y05[11:8]	X05[11:8]=Bit[7:4] Y05[11:8]=Bit[3:0]								
22	X05 LOW COORDINATE	X05[7:0]									
23	Y05 LOW COORDINATE	Y05[7:0]									
24	RESERVED	RESERVED									
25	X06 HIGH COORDINATE Y06 HIGH COORDINATE	X06[11:8] Y06[11:8]	X06[11:8]=Bit[7:4] Y06[11:8]=Bit[3:0]								
26	X06 LOW COORDINATE	X06[7:0]									
27	Y06 LOW COORDINATE	Y06[7:0]									
28	RESERVED	RESERVED									
29	X07 HIGH COORDINATE Y07 HIGH COORDINATE	X07[11:8] Y07[11:8]	X07[11:8]=Bit[7:4] Y07[11:8]=Bit[3:0]								
30	X07 LOW COORDINATE	X07[7:0]									
31	Y07 LOW COORDINATE	Y07[7:0]									
32	RESERVED	RESERVED									
33	X08 HIGH COORDINATE Y08 HIGH COORDINATE	X08[11:8] Y08[11:8]	X08[11:8]=Bit[7:4] Y08[11:8]=Bit[3:0]								
34	X08 LOW COORDINATE	X08[7:0]									
35	Y08 LOW COORDINATE	Y08[7:0]									
36	RESERVED	RESERVED									
37	X09 HIGH COORDINATE Y09 HIGH COORDINATE	X09[11:8] Y09[11:8]	X09[11:8]=Bit[7:4] Y09[11:8]=Bit[3:0]								
38	X09 LOW COORDINATE	X09[7:0]									
39	Y09 LOW COORDINATE	Y09[7:0]									
40	RESERVED	RESERVED									
41	P SENSOR[3:0] TOUCH KEY[3:0]	PROXIMITY & TOUCH KEY DATA	P SENSOR[3:0]=Bit[7:4]				Key 3	Key 2	Key 1	Key 0	
42	CHECKSUM	RESERVED	CHECKSUM= ADD DATA FROM BYTE0 TO BYTE41								

13 INSPECTION CRITERIA

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

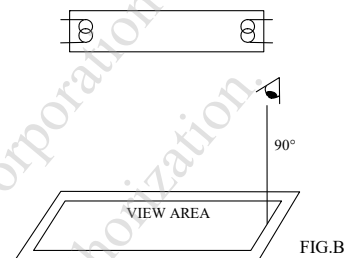
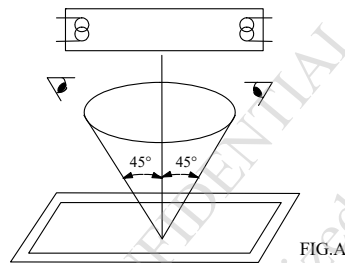
13.2 INSPECTION CONDITIONS

13.2.1 (1)OBSERVATION DISTANCE : $45\pm 5\text{cm}$

(2)VIEWING ANGLE : $\pm 45^\circ$

$\pm 45^\circ$ (FOR SECTION WITHIN VIEWING AREA), REFER TO FIG.A
 90° (FOR SECTION OUTSIDE OF VIEWING AREA), REF TO FIG.B
 PERPENDICULAR TO MODULE SURFACE

VIEWING ANGLE SHOULD BE SMALLER THAN 45°



THE INSPECTION CRITERIA IS ACCORDING TO LINE OF SIGHT. INSPECTION SHALL BE MADE WITHIN THE HALF SECTION OF THE VIEWING CONE GENERATED BY LINE SEGMENT OF 45° WITH RESPECT TO THE VERTICAL AXIS FROM CENTER VERTEX OF LCD, THE FLUORESCENT LAMP AND THE CONE AXIS MUST BE PERPENDICULAR TO THE LCD SURFACE.

IF THE DEFECTS ARE OUTSIDE OF VIEWING AREA, IT SHALL BE INSPECTED BY 90° WITH RESPECT TO THE VERTICAL AXIS FROM EDGE OF VIEWING AREA.

13.2.2 ENVIRONMENT CONDITIONS :

AMBIENT TEMPERATURE		$25\pm 5^\circ\text{C}$
AMBIENT HUMIDITY		$65 \pm 20\%\text{RH}$
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 INSPECTION METHOD

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

(a)APPLICABLE STANDARD :




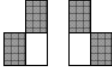
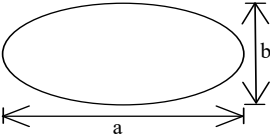
ANSI/ ASQ Z1.4 NORMAL INSPECTION LEVEL II

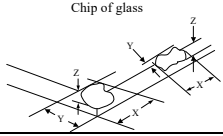
(b)AQL : MAJOR DEFECT : AQL 0.65

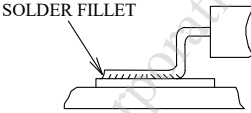
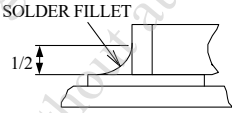
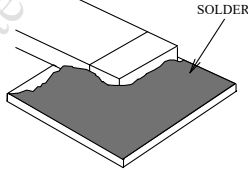
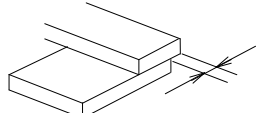
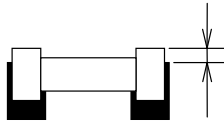
MINOR DEFECT : AQL 1.0

13.3 DEFECTS CLASSIFICATION

TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	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.CTP FUNCTION	<ul style="list-style-type: none"> • NO FUNCTION • BROKEN LINE • FALSE TOUCH 	
	3.BACKLIGHT	<ul style="list-style-type: none"> • NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION 	
	4.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 • UNEVEN COLOR SPREAD 	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 	

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" data-bbox="600 618 1385 857"> <thead> <tr> <th colspan="2">DEFECT TYPE</th> <th>CRITERIA</th> </tr> </thead> <tbody> <tr> <td rowspan="3">BRIGHT DOT</td> <td>RANDOM</td> <td>$N \leq 3$</td> </tr> <tr> <td>2 DOTS ADJACENT</td> <td>$N \leq 0$</td> </tr> <tr> <td>3 DOTS ADJACENT</td> <td>$N \leq 0$</td> </tr> <tr> <td rowspan="3">DARK DOT</td> <td>RANDOM</td> <td>$N \leq 4$</td> </tr> <tr> <td>2 DOTS ADJACENT</td> <td>$N \leq 0$</td> </tr> <tr> <td>3 DOTS ADJACENT</td> <td>$N \leq 0$</td> </tr> <tr> <td colspan="2">TOTAL BRIGHT AND DARK DOT</td> <td>$N \leq 6$</td> </tr> <tr> <td rowspan="2">DISTANCE</td> <td>MINIMUM DISTANCE BETWEEN DARK DOTS</td> <td rowspan="2">5 mm</td> </tr> <tr> <td>MINIMUM DISTANCE BETWEEN DARK AND BRIGHT DOT.</td> </tr> </tbody> </table> <p>NOTE :</p> <p>1. DEFINITION OF DOT DEFECT INDUCED FROM THE PANEL INSIDE</p> <p>(A) BRIGHT DOT : DOTS APPEAR BRIGHT AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER BLACK PATTERN.</p> <p>(B) DARK DOT : DOTS APPEAR DARK AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER PURE RED, GREEN, BLUE PICTURE.</p> <p>(C) 2 DOT ADJACENT = 1 PAIR = 2 DOTS</p> <p>PICTURE:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>2 dot adjacent</p> </div> <div style="text-align: center;">  <p>2 dot adjacent</p> </div> <div style="text-align: center;">  <p>2 dot adjacent (vertical)</p> </div> <div style="text-align: center;">  <p>2 dot adjacent (slant)</p> </div> </div>	DEFECT TYPE		CRITERIA	BRIGHT DOT	RANDOM	$N \leq 3$	2 DOTS ADJACENT	$N \leq 0$	3 DOTS ADJACENT	$N \leq 0$	DARK DOT	RANDOM	$N \leq 4$	2 DOTS ADJACENT	$N \leq 0$	3 DOTS ADJACENT	$N \leq 0$	TOTAL BRIGHT AND DARK DOT		$N \leq 6$	DISTANCE	MINIMUM DISTANCE BETWEEN DARK DOTS	5 mm	MINIMUM DISTANCE BETWEEN DARK AND BRIGHT DOT.
DEFECT TYPE		CRITERIA																								
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DISTANCE	MINIMUM DISTANCE BETWEEN DARK DOTS	5 mm																								
	MINIMUM DISTANCE BETWEEN DARK AND BRIGHT DOT.																									
4	BUBBLES OF POLARIZER /DIRT/CF FAIL /SURFACE STAINS	<table border="1" data-bbox="580 1308 1353 1626"> <thead> <tr> <th></th> <th>AVERAGE DIAMETER (mm) : D</th> <th>NUMBER OF PIECES PERMITTED</th> </tr> </thead> <tbody> <tr> <td rowspan="3">BUBBLE ON THE POLARIZER</td> <td>$D \leq 0.15$</td> <td>IGNORE</td> </tr> <tr> <td>$0.15 < D \leq 0.5$</td> <td>$N \leq 4$</td> </tr> <tr> <td>$0.5 < D$</td> <td>NONE</td> </tr> <tr> <td rowspan="3">SURFACE STAINS</td> <td>$D \leq 0.15$</td> <td>IGNORE</td> </tr> <tr> <td>$0.15 < D \leq 0.5$</td> <td>$N \leq 4$</td> </tr> <tr> <td>$0.5 < D$</td> <td>NONE</td> </tr> <tr> <td rowspan="3">CF FAIL / SPOT</td> <td>$D \leq 0.15$</td> <td>IGNORE</td> </tr> <tr> <td>$0.15 < D \leq 0.5$</td> <td>$N \leq 4$</td> </tr> <tr> <td>$0.5 < D$</td> <td>NONE</td> </tr> </tbody> </table> <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> <div style="text-align: center;">  </div>		AVERAGE DIAMETER (mm) : D	NUMBER OF PIECES PERMITTED	BUBBLE ON THE POLARIZER	$D \leq 0.15$	IGNORE	$0.15 < D \leq 0.5$	$N \leq 4$	$0.5 < D$	NONE	SURFACE STAINS	$D \leq 0.15$	IGNORE	$0.15 < D \leq 0.5$	$N \leq 4$	$0.5 < D$	NONE	CF FAIL / SPOT	$D \leq 0.15$	IGNORE	$0.15 < D \leq 0.5$	$N \leq 4$	$0.5 < D$	NONE
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NO.	ITEM	CRITERIA											
5	BLACK/WHITE SPOT CIRCULAR TYPE	<p>THE FOLLOWING BLACK/WHITE SPOT ARE WITHIN THE VIEWING AREA. AVERAGE DIAMETER : D (mm)</p> <table border="1"> <thead> <tr> <th>SIZE D</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.3$</td> <td>IGNORE</td> </tr> <tr> <td>$0.3 < D \leq 0.5$</td> <td>5</td> </tr> <tr> <td>$D > 0.5$</td> <td>0</td> </tr> </tbody> </table> <p>NOTE (1) : THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</p>		SIZE D	PERMISSIBLE NO.	$D \leq 0.3$	IGNORE	$0.3 < D \leq 0.5$	5	$D > 0.5$	0		
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$0.3 < D \leq 0.5$	5												
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6	SCRATCH	<p>THE FOLLOWING SCRATCH IS WITHIN THE VIEWING AREA. WIDTH : W (mm) , LENGTH : L (mm)</p> <table border="1"> <thead> <tr> <th>SIZE W & L</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.1$</td> <td>IGNORE</td> </tr> <tr> <td>$0.1 < W \leq 0.2, L \leq 5$</td> <td>5</td> </tr> <tr> <td>$W > 0.2$</td> <td>0</td> </tr> </tbody> </table> <p>NOTE (1) : THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</p>		SIZE W & L	PERMISSIBLE NO.	$W \leq 0.1$	IGNORE	$0.1 < W \leq 0.2, L \leq 5$	5	$W > 0.2$	0		
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$W > 0.2$	0												
7	BLACK / WHITE LINE LINEAR TYPE / FOREIGN FIBER	<p>THE FOLLOWING BLACK LINE, WHITE LINE IS WITHIN THE VIEWING AREA. WIDTH : W (mm) , LENGTH : L (mm)</p> <table border="1"> <thead> <tr> <th>SIZE W & L</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.1$</td> <td>IGNORE</td> </tr> <tr> <td>$0.1 < W \leq 0.2, L \leq 5$</td> <td>5</td> </tr> <tr> <td>$W > 0.2$</td> <td>0</td> </tr> </tbody> </table> <p>NOTE (1) : THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</p>		SIZE W & L	PERMISSIBLE NO.	$W \leq 0.1$	IGNORE	$0.1 < W \leq 0.2, L \leq 5$	5	$W > 0.2$	0		
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8	BUBBLE / DENT FOR OPTICAL BONDING	<p>BUBBLES WITHIN VIEWING AREA. AVERAGE DIAMETER : D (mm)</p> <table border="1"> <thead> <tr> <th>SIZE D</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.2$</td> <td>IGNORE</td> </tr> <tr> <td>$0.2 < D \leq 0.3$</td> <td>3</td> </tr> <tr> <td>$0.3 < D \leq 0.5$</td> <td>2</td> </tr> <tr> <td>$D > 0.5$</td> <td>0</td> </tr> </tbody> </table> <p>NOTE (1) : THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 10mm APART.</p>		SIZE D	PERMISSIBLE NO.	$D \leq 0.2$	IGNORE	$0.2 < D \leq 0.3$	3	$0.3 < D \leq 0.5$	2	$D > 0.5$	0
SIZE D	PERMISSIBLE NO.												
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9	CHIPPING	<table border="1"> <tbody> <tr> <td>CORNER</td> <td>$X \leq 3mm \cdot Y \leq 3mm \cdot Z \leq t$ (t : THICKNESS)</td> </tr> <tr> <td>EDGE</td> <td>$X \leq 6mm, Y \leq 1mm, Z < t$ (t : THICKNESS)</td> </tr> </tbody> </table>	CORNER	$X \leq 3mm \cdot Y \leq 3mm \cdot Z \leq t$ (t : THICKNESS)	EDGE	$X \leq 6mm, Y \leq 1mm, Z < t$ (t : THICKNESS)	 <p>Chip of glass</p>						
CORNER	$X \leq 3mm \cdot Y \leq 3mm \cdot Z \leq t$ (t : THICKNESS)												
EDGE	$X \leq 6mm, Y \leq 1mm, Z < t$ (t : THICKNESS)												
10	CRACKED GLASS	NOT ACCEPTABLE											
11	LINE DEFECT ON DISPLAY	OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOWED.											
12	MURA & LEAK ON DISPLAY	IT'S ACCEPTABLE, IF MURA AND LEAK IS SLIGHT VISIBLE THROUGH 5% ND FILTER.											
13	UNEVEN COLOR SPREAD, COLORATION	TO BE DETERMINED BASED UPON THE LIMITED SAMPLE.											
14	BEZEL APPEARANCE	<p>1. BEZEL MAY NOT HAVE RUST, BE DEFORMED OR HAVE FINGER PRINTS STAINS OF OTHER CONTAMINATION.</p> <p>2. BEZEL MUST COMPLY WITH JOB SPECIFICATIONS.</p>											

NO.	ITEM	CRITERIA
15	PCB	<ol style="list-style-type: none"> 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 ON 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.
16	SOLDERING	<ol style="list-style-type: none"> 1. NO SOLDERING FOUND ON THE SPECIFIED PLACE 2. INSUFFICIENT SOLDER <ol style="list-style-type: none"> (a) LSI, IC A POOR WETTING OF SOLDER IS BETWEEN LOWER BEND OR "HEEL" OF LEAD AND PAD  (b) CHIP COMPONENT <ul style="list-style-type: none"> · 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 ALIGNMENT <ol style="list-style-type: none"> (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.

NO.	ITEM	CRITERIA
17	BACKLIGHT	<ol style="list-style-type: none"> 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.
18	GENERAL APPEARANCE	<ol style="list-style-type: none"> 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.

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14 RELIABILITY TEST

14.1 STANDARD SPECIFICATIONS FOR RELIABILITY OF LCD MODULE

NO.	ITEM	DESCRIPTION
1	HIGH TEMPERATURE TEST (OPERATION)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +70°C FOR 240 HRS
2	LOW TEMPERATURE TEST (OPERATION)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -20°C FOR 240 HRS
3	HIGH TEMPERATURE TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +80°C FOR 240 HRS
4	LOW TEMPERATURE TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -30°C FOR 240 HRS
5	HIGH TEMPERATURE / HUMIDITY TEST (STORAGE)	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 50°C, 85% RH 240 HRS
6	THERMAL SHOCK TEST (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 ± 8KV CONTACT DISCHARGE ± 4KV (ACCORDING TO IEC-61000-4-2)

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.

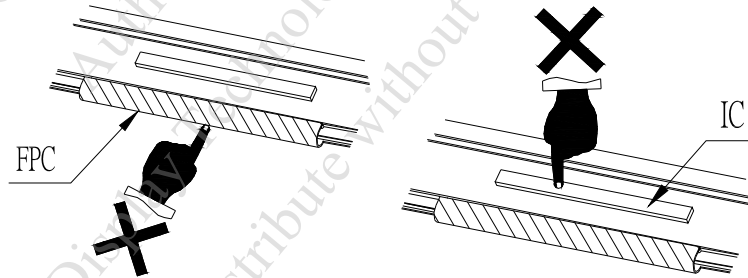
NOTE (2) : TESTING CONDITIONS AND INSPECTION CRITERIA

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

15. CAUTION

15.1 OPERATION

- 15.1.1 DO NOT CONNECT OR DISCONNECT MODULES TO OR FROM THE MAIN SYSTEM WHILE POWER IS BEING SUPPLIED .
- 15.1.2 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 .
- 15.1.3 ADJUST THE LC DRIVING VOLTAGE TO OBTAIN THE OPTIMUM CONTRAST.
- 15.1.4 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 .
- 15.1.5 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!



15.2 NOTICE

- 15.2.1 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 .
- 15.2.2 DO NOT DISASSEMBLE . EDT SHALL NOT BE HELD RESPONSIBLE IF THE MODULE IS DISASSEMBLED AND UPON THE REASSEMBLY THE MODULE FAILED .
- 15.2.3 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.
- 15.2.4 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 .
- 15.2.5 DON'T GIVE EXTERNAL SHOCK.
- 15.2.6 DON'T APPLY EXCESSIVE FORCE ON THE SURFACE.
- 15.2.7 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.
- 15.2.8 DON'T OPERATE IT ABOVE THE ABSOLUTE MAXIMUM RATING.
- 15.2.9 STORAGE IN A CLEAN ENVIRONMENT, FREE FROM DUST, ACTIVE GAS AND SOLVENT.
- 15.2.10 STORE WITHOUT ANY PHYSICAL LOAD.
- 15.2.11 REWIRING: NO MORE THAN 3 TIMES.