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Lucica Lu		ISSUE : MAR.10, 2025
APPROVED BY:		TOTAL PAGE : 30
Vincent Wu		VERSION : 2

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO.:

ETM0350G8EDH6

(RoHS)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

RECORDS OF REVISION	DOC . FIRST ISSUE	APR.03, 2018
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DATE	REVISED PAGE NO.	SUMMARY																																																																																				
MAR.10, 2025	3	3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS ITEM: POWER SUPPLY VOLTAGE, SYMBOL:VDD-VSS, MAX.=3.6→3.96																																																																																				
	7	5.4 LCD MODULE PARALLEL RGB INTERFACE (DE MODE) 																																																																																				
	10	6.1 OPTICAL CHARACTERISTICS(NOTE 1) <table border="1"> <thead> <tr> <th>ITEM</th> <th>SYMBOL</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> </tr> </thead> <tbody> <tr> <td rowspan="8">COLOR OF CIE COORDINATE</td> <td rowspan="2">WHITE</td> <td>Wx</td> <td>0.260</td> <td>0.310</td> <td>0.360</td> </tr> <tr> <td>Wy</td> <td>0.260</td> <td>0.310</td> <td>0.360</td> </tr> <tr> <td rowspan="2">RED</td> <td>Rx</td> <td>0.562</td> <td>0.612</td> <td>0.662</td> </tr> <tr> <td>Ry</td> <td>0.305</td> <td>0.355</td> <td>0.405</td> </tr> <tr> <td rowspan="2">GREEN</td> <td>Gx</td> <td>0.262</td> <td>0.312</td> <td>0.362</td> </tr> <tr> <td>Gy</td> <td>0.533</td> <td>0.583</td> <td>0.633</td> </tr> <tr> <td rowspan="2">BLUE</td> <td>Bx</td> <td>0.090</td> <td>0.140</td> <td>0.190</td> </tr> <tr> <td>By</td> <td>0.020</td> <td>0.070</td> <td>0.120</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>ITEM</th> <th>SYMBOL</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> </tr> </thead> <tbody> <tr> <td rowspan="8">COLOR OF CIE COORDINATE</td> <td rowspan="2">WHITE</td> <td>Wx</td> <td>(0.260)</td> <td>(0.310)</td> <td>(0.360)</td> </tr> <tr> <td>Wy</td> <td>(0.270)</td> <td>(0.320)</td> <td>(0.370)</td> </tr> <tr> <td rowspan="2">RED</td> <td>Rx</td> <td>(0.570)</td> <td>(0.620)</td> <td>(0.670)</td> </tr> <tr> <td>Ry</td> <td>(0.310)</td> <td>(0.360)</td> <td>(0.410)</td> </tr> <tr> <td rowspan="2">GREEN</td> <td>Gx</td> <td>(0.280)</td> <td>(0.330)</td> <td>(0.380)</td> </tr> <tr> <td>Gy</td> <td>(0.550)</td> <td>(0.600)</td> <td>(0.650)</td> </tr> <tr> <td rowspan="2">BLUE</td> <td>Bx</td> <td>(0.120)</td> <td>(0.170)</td> <td>(0.220)</td> </tr> <tr> <td>By</td> <td>(0.040)</td> <td>(0.090)</td> <td>(0.140)</td> </tr> </tbody> </table>	ITEM	SYMBOL	MIN.	TYP.	MAX.	COLOR OF CIE COORDINATE	WHITE	Wx	0.260	0.310	0.360	Wy	0.260	0.310	0.360	RED	Rx	0.562	0.612	0.662	Ry	0.305	0.355	0.405	GREEN	Gx	0.262	0.312	0.362	Gy	0.533	0.583	0.633	BLUE	Bx	0.090	0.140	0.190	By	0.020	0.070	0.120	ITEM	SYMBOL	MIN.	TYP.	MAX.	COLOR OF CIE COORDINATE	WHITE	Wx	(0.260)	(0.310)	(0.360)	Wy	(0.270)	(0.320)	(0.370)	RED	Rx	(0.570)	(0.620)	(0.670)	Ry	(0.310)	(0.360)	(0.410)	GREEN	Gx	(0.280)	(0.330)	(0.380)	Gy	(0.550)	(0.600)	(0.650)	BLUE	Bx	(0.120)	(0.170)	(0.220)	By	(0.040)	(0.090)	(0.140)
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1. GENERAL SPECIFICATIONS

1.1 DATA SHEET FOR LCD MODULE CONTROLLER/DRIVER

PLEASE REFER TO :

HIMAX HX8238D

1.2 DATA SHEET FOR CAPACITIVE TOUCH PANEL CONTROLLER/DRIVER

PLEASE REFER TO :

HYCON HY4614

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)

2. MECHANICAL SPECIFICATIONS

2.1 LCD MODULE MECHANICAL SPECIFICATIONS

(1) DISPLAY SIZE	-----	3.5 inch
(2) NUMBER OF DOTS	-----	320W * (RGB) * 240H DOTS
(3) MODULE SIZE	-----	76.8W * 63.8H * 9.2D (MAX.) mm (WITHOUT FPC)
(4) VIEWING AREA	-----	71.812W * 54.27H mm (T/P)
(5) ACTIVE AREA	-----	70.08W * 52.56H mm
(6) DOT SIZE	-----	0.073W * 0.219H mm
(7) PIXEL SIZE	-----	0.219W * 0.219H mm
(8) LCD TYPE	-----	TFT , TRANSMISSIVE
(9) COLOR	-----	262K
(10) VIEWING DIRECTION	-----	6 O'CLOCK (GRAY LEVEL INVERSION)
(11) BACK LIGHT	-----	LED , COLOR : WHITE
(12) INTERFACE MODE	-----	RGB 18BIT PARALLEL (DE/SYNC MODE)

MODEL NO.	VERSION	PAGE
ETM0350G8EDH6	2	2

2.2 CAPACITIVE TOUCH PANEL MECHANICAL SPECIFICATIONS

- (1) TOUCH PANEL SIZE ----- 3.5 inch
- (2) OUTER DIMENSION ----- 76.4W * 63H * 1.4D mm
(WITHOUT FPC)
- (3) VIEWING AREA ----- 71.812W * 54.27H mm
- (4) ACTIVE AREA ----- 70.8W * 53.27H mm
- (5) INPUT TYPE ----- MULTI TOUCH
- (6) NUMBER OF TOUCH SENSOR ----- 14*10 SENSORS
- (7) RESOLUTION ----- 896*640
- (8) INTERFACE MODE ----- I2C

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3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	VSS-0.3	3.96	V	—
	VCC-VSS	-0.3	6.0	V	
STATIC ELECTRICITY	—	—	—	V	NOTE (1)
LED BACKLIGHT POWER DISSIPATION	PD	—	558	mW	—
LED BACKLIGHT FORWARD CURRENT	IF	—	30	mA	—
LED BACKLIGHT REVERSE VOLTAGE	VR	—	30	V	—

NOTE (1) : LCM SHOULD BE GROUNDED DURING HANDLING 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	—	2.45m/s ² (0.25G)	—	11.76m/s ² (1.2G)	5~20Hz , 1HR 20~500Hz(20Hz) , 1HR 20~500Hz(500Hz) , 1HR X,Y,Z,TOTAL 3HRS
SHOCK	—	29.4m/s ² (3G)	—	490m/s ² (50G)	10 ms XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (1) : Ta AT -30°C : WILL BE 48HRS MAX.

80°C : WILL BE 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).

4. ELECTRICAL CHARACTERISTICS

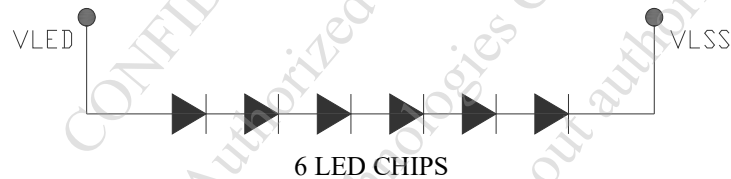
Ta = 25 °C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
POWER SUPPLY VOLTAGE	VDD-VSS	—	2.5	3.3	3.6	V	
POWER SUPPLY VOLTAGE FOR LED DRIVER	VCC-VSS	—	2.7	3.3	3.6	V	
LOGIC HIGH INPUT VOLTAGE	VIH	H LEVEL	0.8*VDD	—	VDD	V	NOTE (1)
LOGIC LOW INPUT VOLTAGE	VIL	L LEVEL	0	—	0.2*VDD	V	
POWER SUPPLY CURRENT	IDD	VDD-VSS=3.3V	—	17.5	27.0	mA	NOTE (2)
POWER SUPPLY CURRENT FOR LED DRIVER	ICC	VCC-VSS=3.3V LED B/L=ON	—	220	290	mA	
POWER SUPPLY FOR LED BACKLIGHT	VLED-VLSS	IF=20mA	16.8	18.0	18.6	V	NOTE (3)
LED LIFE TIME	—	—	30K	40K	—	HRS	NOTE (5) NOTE (6)

NOTE (1) : APPLIED TO TERMINALS /RESET, B5~B0, G5~G0, R5~R0, DCLK, HSYNC, VSYNC, ENB.

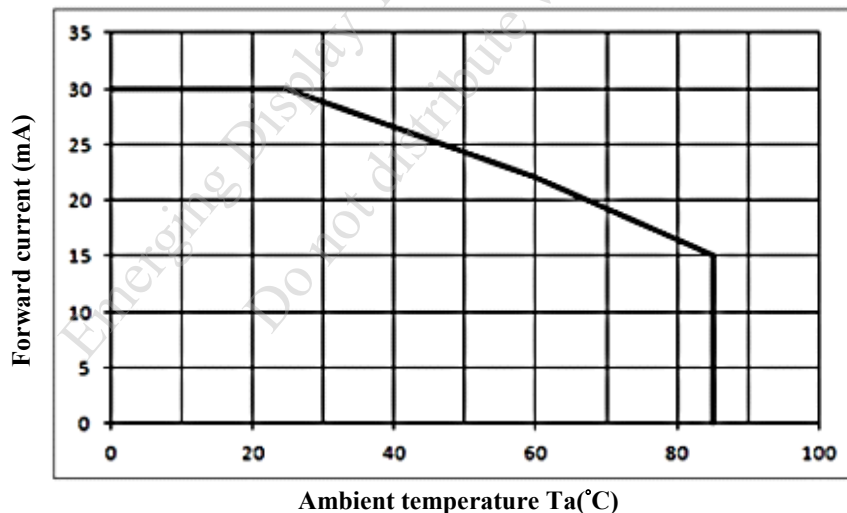
NOTE (2) : THE DISPLAY PATTERN IS ALL “WHITE”.

NOTE (3) : INTERNAL CIRCUIT DIAGRAM OF BACKLIGHT



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

Forward current derating curve VS.Ambient temperature



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

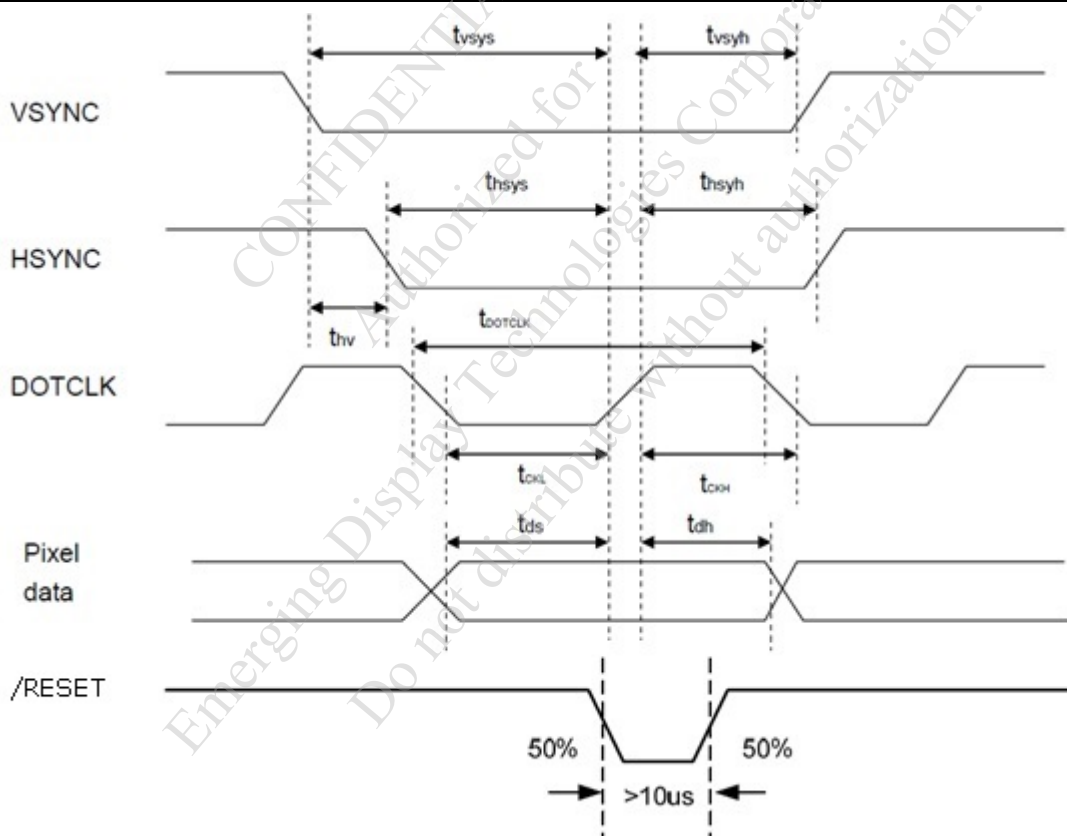
NOTE (6) : DEFINITIONS OF LIFE TIME :

LCM LUMINANCE BECOMES HALF OF THE INITIAL VALUE.

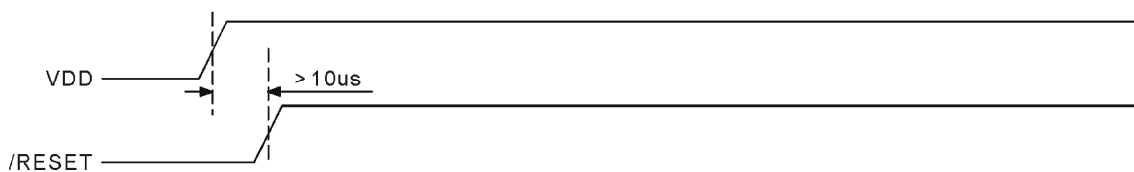
5. TIMING CHARACTERISTICS

5.1 LCD MODULE PIXEL TIMING

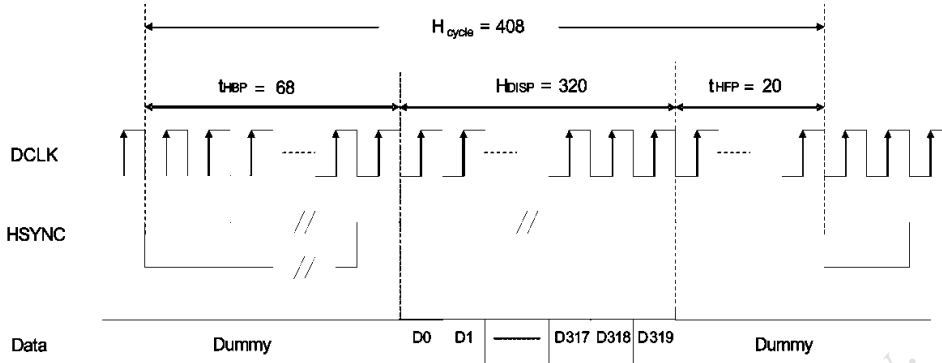
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
DOTCLK FREQUENCY	fDOTCLK	—	6.5	10	MHz
DOTCLK PERIOD	tDOTCLK	100	154	—	ns
VERTICAL SYNC SETUP TIME	tvsys	20	—	—	ns
VERTICAL SYNC HOLD TIME	tvsyh	20	—	—	ns
HORIZONTAL SYNC SETUP TIME	thsys	20	—	—	ns
HORIZONTAL SYNC HOLD TIME	thsyh	20	—	—	ns
PHASE DIFFERENCE OF SYNC SIGNAL FALLING EDGE	thv	1	—	240	tDOTCLK
DOTCLK LOW PERIOD	tCKL	50	—	—	ns
DOTCLK HIGH PERIOD	tCKH	50	—	—	ns
DATA SETUP TIME	tds	12	—	—	ns
DATA HOLD TIME	tdh	12	—	—	ns
RESET PULSE WIDTH	tRES	10	—	—	μs



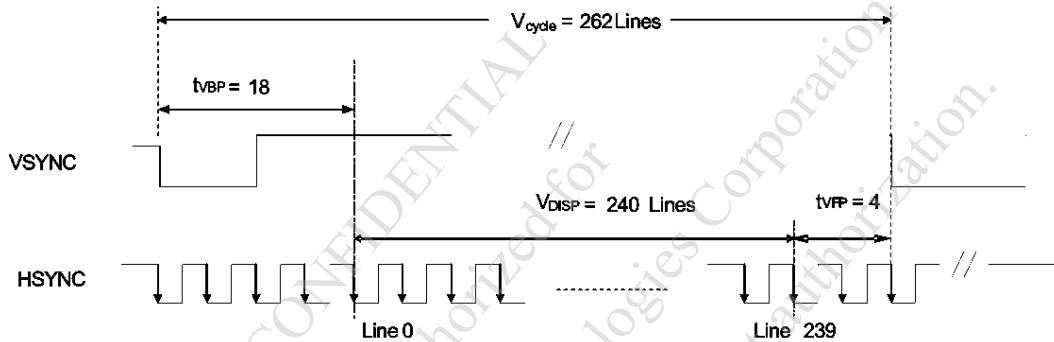
5.2 RESET TIMING



5.3 LCD MODULE PARALLEL RGB INTERFACE (SYNC MODE)



HORIZONTAL DATA TRANSACTION TIMING

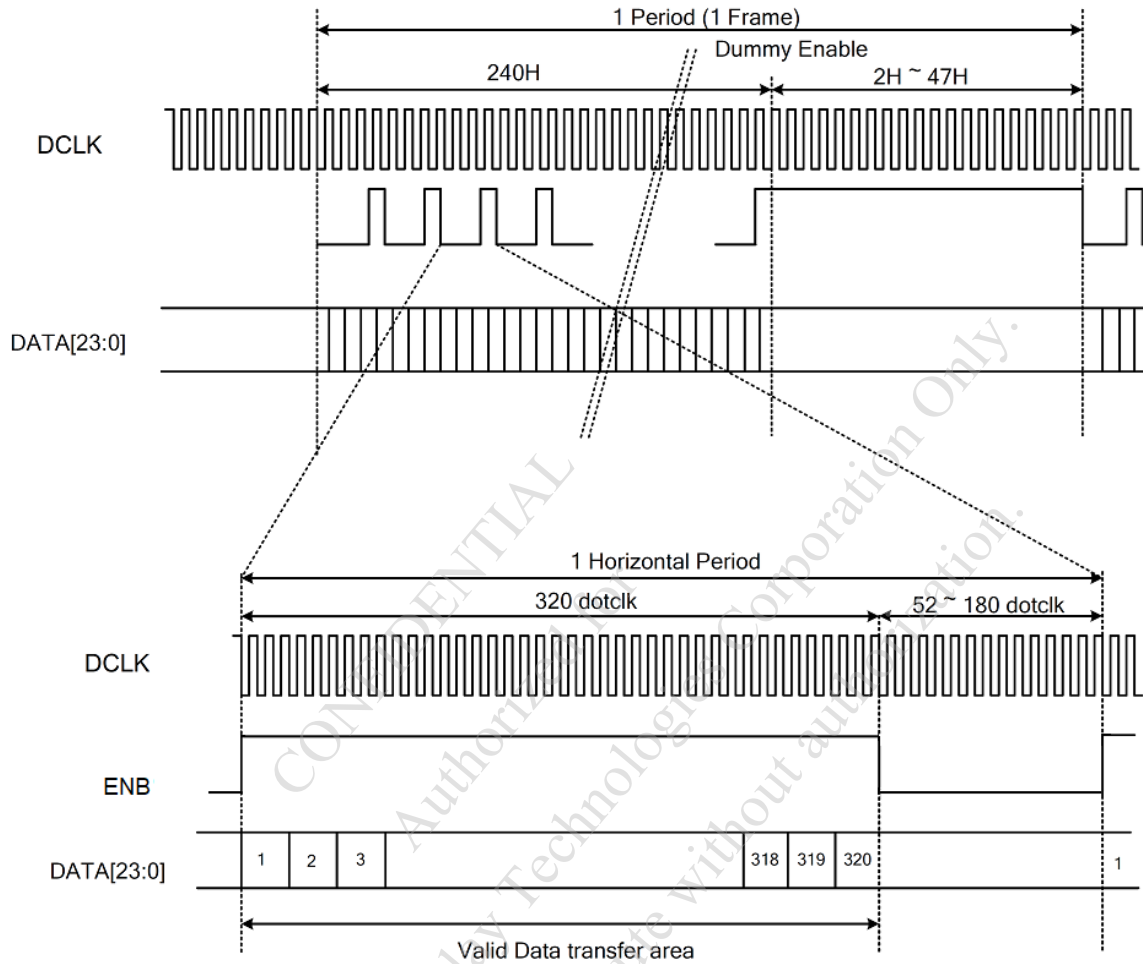


VERTICAL DATA TRANSACTION TIMING

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
DCLK FREQUENCY	f _{DCLK}	—	6.5	10	MHz
DCLK PERIOD	t _{DCLK}	100	154	—	ns
HORIZONTAL FREQUENCY (LINE)	f _H	—	15.75	22.35	KHz
VERTICAL FREQUENCY (REFRESH)	f _V	—	60	90	Hz
HORIZONTAL BACK PORCH	t _{HBP}	—	68	—	tDCLK
HORIZONTAL FRONT PORCH	t _{HFP}	—	20	—	tDCLK
HSYNC LOW PULSE WIDTH	t _{WH}	2	32	—	tDOTCLK
HORIZONTAL DATA START POINT	t _{HBP}	9	68	127	tDCLK
HORIZONTAL BLANKING PERIOD	t _{HBP} + t _{HFP}	52	88	180	tDCLK
HORIZONTAL DISPLAY AREA	H _{DISP}	—	320	—	tDCLK
HORIZONTAL CYCLE	H _{cycle}	350	408	450	tDCLK
VSYNC LOW PULSE WIDTH	t _{VW}	2	4	—	Lines
VERTICAL BACK PORCH	t _{vBP}	2	18	127	Lines
VERTICAL FRONT PORCH	t _{vFP}	—	4	—	Lines
VERTICAL DATA START POINT	t _{vBP}	—	18	—	Lines
VERTICAL BLANKING PERIOD	t _{vBP} + t _{vFP}	—	22	—	Lines
VERTICAL BLANKING PERIOD	NTSC	10	22	47	Lines
	PAL	20	33	120	
	PAL	12	25	112	
VERTICAL DISPLAY AREA	NTSC	—	240	—	Lines
	PAL	—	280(PALM=0) 280(PALM=1)	—	
VERTICAL CYCLE	NTSC	250	262	287	Lines
	PAL	300	313	400	

DATA TRANSACTION TIMING IN NORMAL OPERATING MODE

5.4 LCD MODULE PARALLEL RGB INTERFACE (DE MODE)



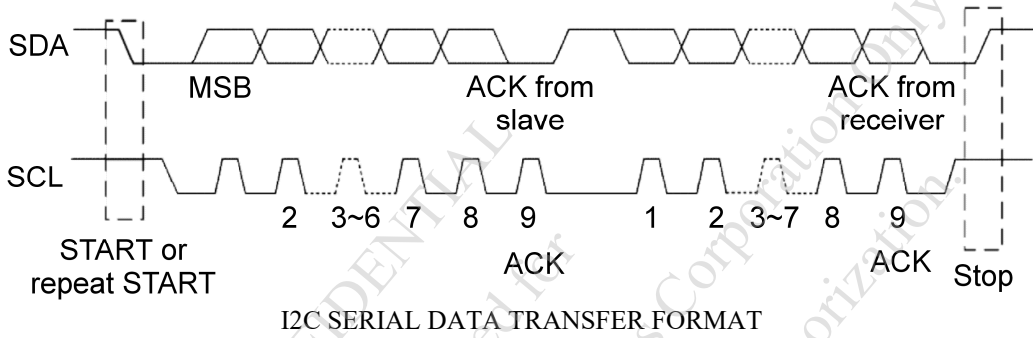
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
DOTCLK FREQUENCY	f _{DOTCLK}	—	6.5	10	MHz
DOTCLK PERIOD	t _{DOTCLK}	100	154	—	ns
HORIZONTAL BLANKING PERIOD	t _{HBP} + t _{HFP}	52	88	180	t _{DOTCLK}
HORIZONTAL DISPLAY AREA	H _{DISP}	—	320	—	t _{DOTCLK}
HORIZONTAL CYCLE	H _{cycle}	372	408	500	t _{DOTCLK}
VERTICAL BLANKING PERIOD	t _{VBP} + t _{VFP}	2	—	47	Lines
VERTICAL DISPLAY AREA	V _{DISP}	—	240	—	Lines
VERTICAL CYCLE	V _{cycle}	242	—	287	Lines

DATA TRANSACTION TIMING IN DE ONLY OPERATING MODE

5.5 CAPACITIVE TOUCH PANEL

5.5.1 I2C INTERFACE TIMING CHARACTERISTICS

ITEM	MIN.	TYP.	MAX.	UNIT
SCL FREQUENCY	—	—	400	KHz
BUS FREE TIME BETWEEN A STOP AND START CONDITION	1.3	—	—	us
HOLD TIME (REPEATED) START CONDITION	0.6	—	—	us
DATA SETUP TIME	100	—	—	ns
SETUP TIME FOR A REPEATED START CONDITION	0.6	—	—	us
SETUP TIME FOR STOP CONDITION	0.6	—	—	us

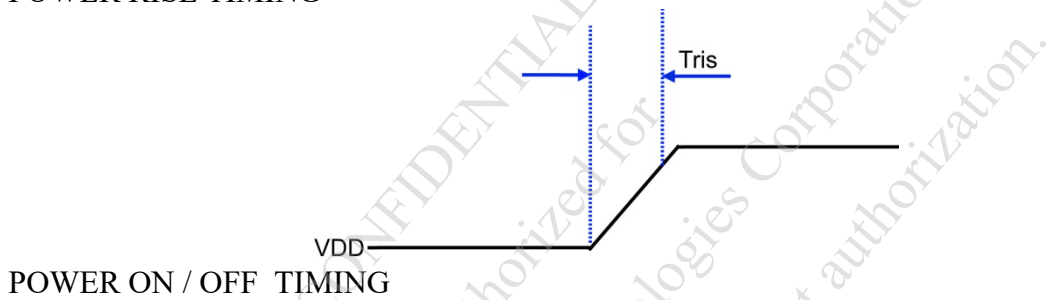


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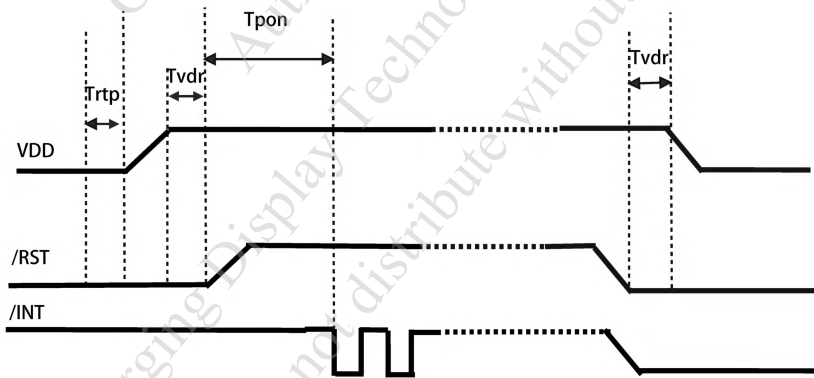
5.5.2 POWER SEQUENCE

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
RISE TIME FROM 0.1VDD TO 0.9VDD	Tris	—	—	5	ms
TIME OF RESETTING TO BE LOW BEFORE POWERING ON	Trtp	100	—	—	us
TIME OF STARTING TO REPORT POINT AFTER POWERING ON	Tpon	200	—	—	ms
RESET TIME AFTER VDD POWERING ON	Tvdr	1	—	—	ms
TIME OF STARTING TO REPORT POINT AFTER RESETTING	Trsi	200	—	—	ms
RESET TIME	Trst	2	—	—	ms

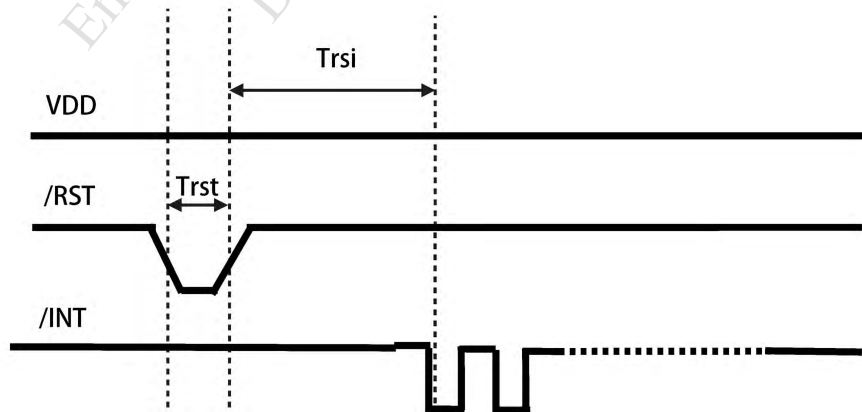
POWER RISE TIMING



POWER ON / OFF TIMING



RESET SEQUENCE



6. OPTICAL CHARACTERISTICS

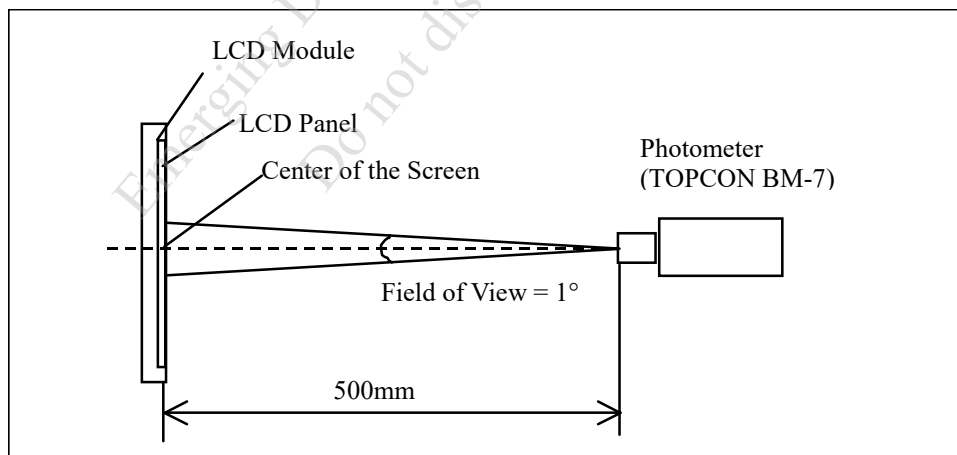
6.1 OPTICAL CHARACTERISTICS(NOTE 1)

Ta = 25 ± 2°C

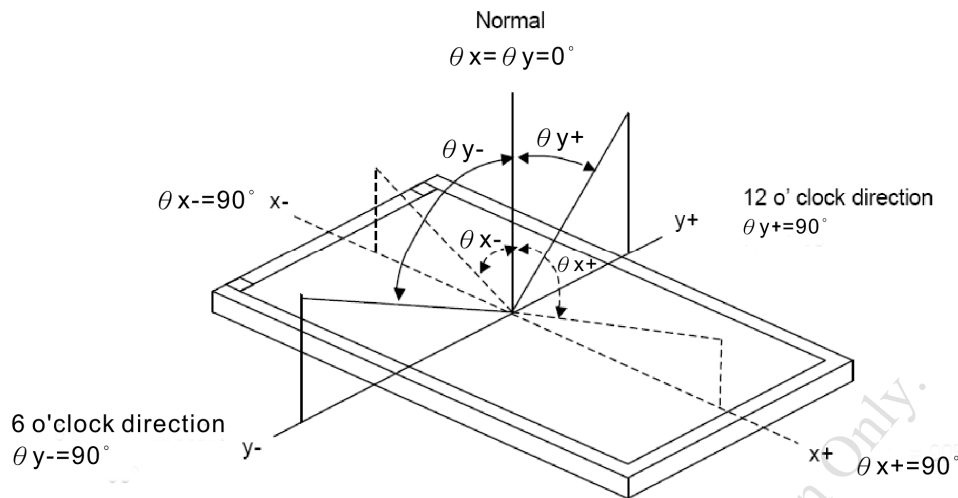
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK	
VIEWING ANGLE	θ_{y+}	CR ≥ 10	$\theta_x=0^\circ$	50	55	—	deg.	NOTE (2) NOTE (3)
	θ_{y-}			70	75	—		
	θ_{x+}		$\theta_y=0^\circ$	70	75	—		
	θ_{x-}			70	75	—		
CONTRAST RATIO	CR	$\theta_x=0^\circ, \theta_y=0^\circ$	350	450	—	—	NOTE (3)	
RESPONSE TIME	T _R (rise)	$\theta_x=0^\circ, \theta_y=0^\circ$	—	15	20	msec	NOTE (4)	
	T _F (fall)		—	35	50			
COLOR OF CIE COORDINATE	WHITE	$\theta_x=0^\circ, \theta_y=0^\circ$ IF=20mA NTSC : 60%	W _x	(0.260)	(0.310)	(0.360)	—	NOTE (5)
			W _y	(0.270)	(0.320)	(0.370)		
	RED		R _x	(0.570)	(0.620)	(0.670)		
			R _y	(0.310)	(0.360)	(0.410)		
	GREEN		G _x	(0.280)	(0.330)	(0.380)		
			G _y	(0.550)	(0.600)	(0.650)		
	BLUE		B _x	(0.120)	(0.170)	(0.220)		
			B _y	(0.040)	(0.090)	(0.140)		
THE BRIGHTNESS OF MODULE	B	$\theta_x=0^\circ, \theta_y=0^\circ$ IF=20mA	382	425	—	cd/m ²	NOTE (6)	
THE UNIFORMITY OF BRIGHTNESS	—		70	—	—	%		

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.



NOTE (2) : DEFINITION OF VIEWING ANGLE :

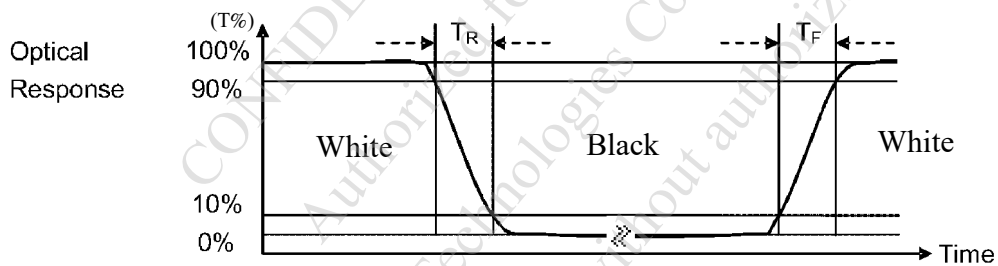


NOTE (3) : DEFINITION OF CONTRAST RATIO :

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

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

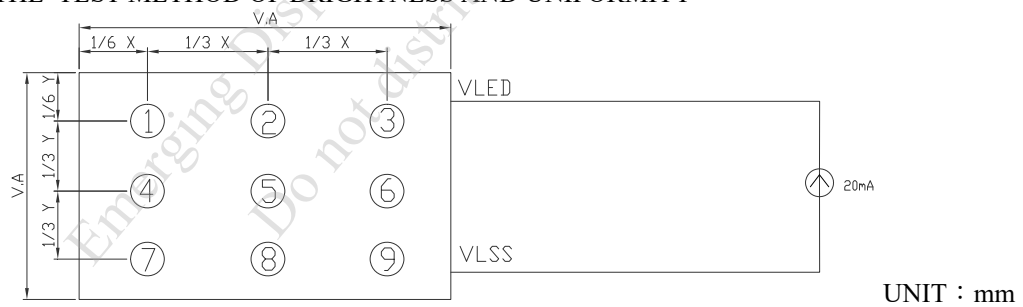
THE FIGURE BELOW IS THE OUTPUT SIGNAL OF THE PHOTO DETECTOR.



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

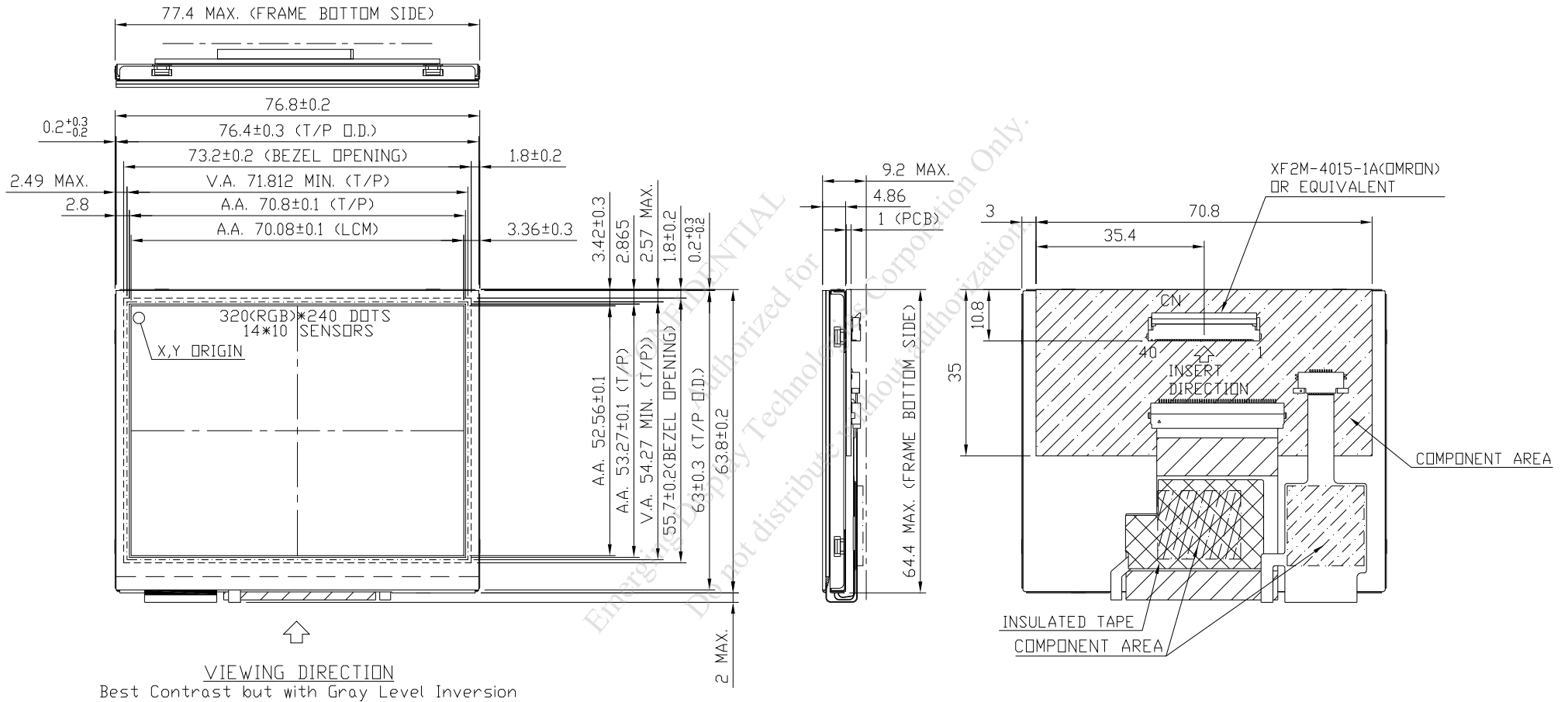
(b) THE TEST METHOD OF BRIGHTNESS AND UNIFORMITY



(c) THE CALCULATING METHOD OF UNIFORMITY

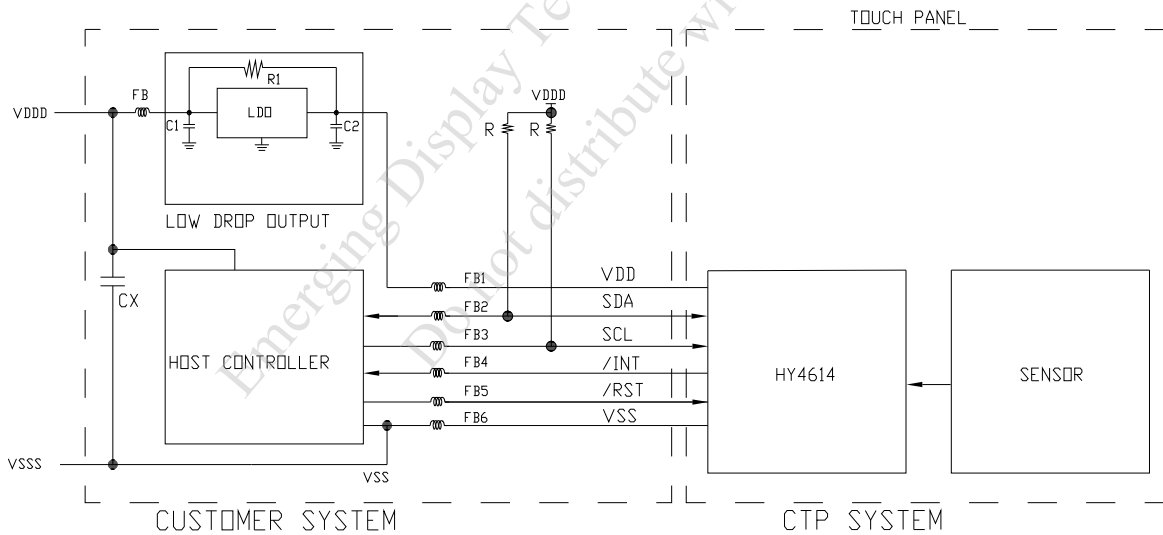
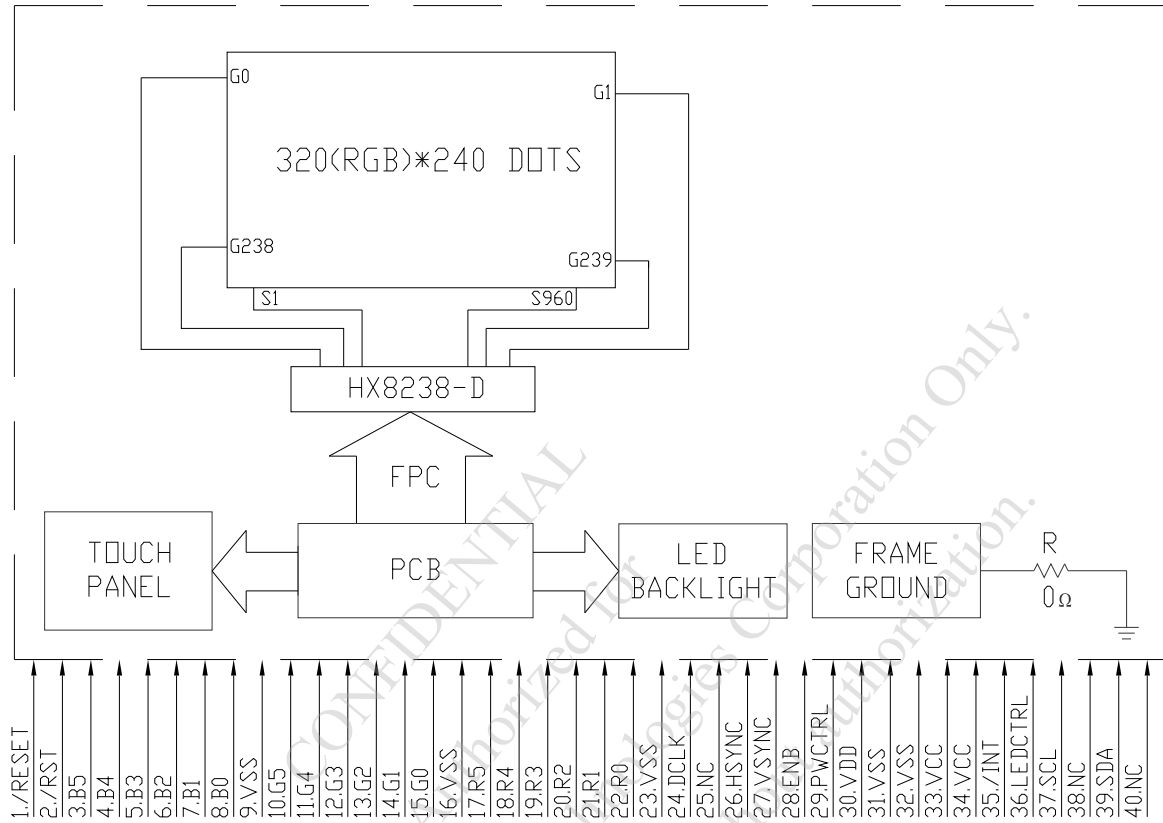
$$\text{UNIFORMITY} : \left[1 - \frac{\text{MAXIMUM BRIGHTNESS} - \text{MINIMUM BRIGHTNESS}}{\text{AVERAGE BRIGHTNESS}} \right] \times 100\%$$

7. OUTLINE DIMENSIONS



UNIT : mm
SCALE : NTS
NOT SPECIFIED LENGTH TOLERANCE IS ± 0.5

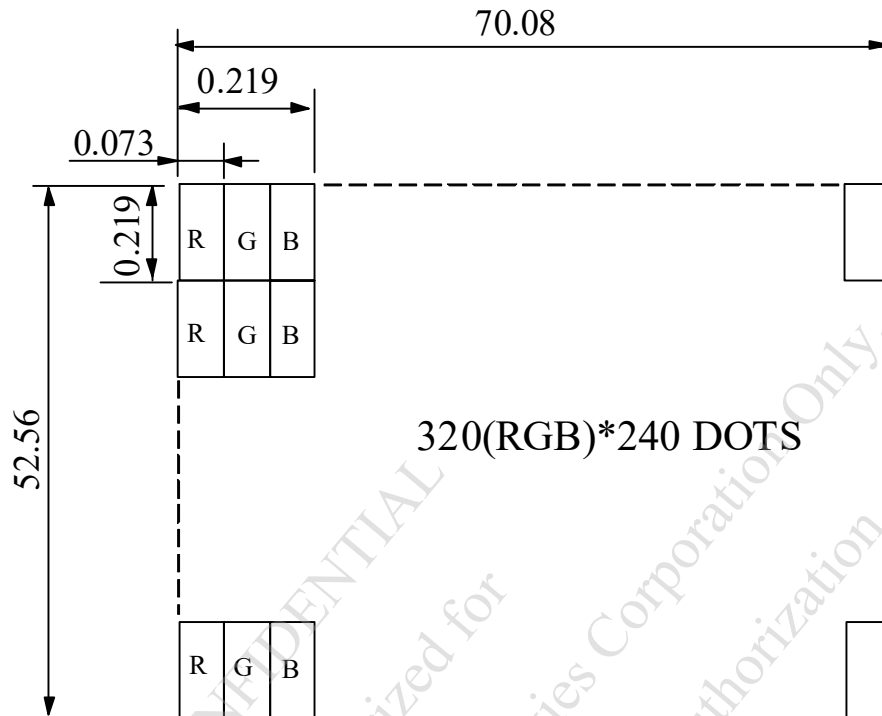
8. BLOCK DIMENSION



NOTE (1) : THE STANDARD IIC COMMUNICATION INTERFACE, SUPREME SCL CLOCK IS 400 KHz, SLAVE ADDRESS CAN BE SET UP, SUPPORTS VDD LEVEL POWER, NEEDS PULL HIGH RESISTANCE AND WE RECOMMEND THE PULL HIGH RESISTANCE IS 2.0K OHM.

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 : 4.7μF OR 10 μF

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/P	FUNCTION									
1	/RESET	I	HARDWARE RESET									
2	/RST	I	EXTERNAL RESET, LOW IS ACTIVE	TOUCH PANEL								
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	NC	—	NON CONNECTION									
26	HSYNC	I	HORIZONTAL SYNC INPUT	DE MODE : HSYNC, VSYNC FLOATING SYNC MODE : ENB CONNECTED TO GROUND								
27	VSYNC	I	VERTICAL SYNC INPUT									
28	ENB	I	DATA ENABLE INPUT									
29	PWCTRL	I	<table border="1"> <thead> <tr> <th></th> <th>PWCTRL</th> <th>REMARK</th> </tr> </thead> <tbody> <tr> <td rowspan="2">LOGIC LEVEL H=3.3V L=0V</td> <td>H</td> <td>POWER ON</td> </tr> <tr> <td>L</td> <td>SHUTDOWN</td> </tr> </tbody> </table>			PWCTRL	REMARK	LOGIC LEVEL H=3.3V L=0V	H	POWER ON	L	SHUTDOWN
				PWCTRL	REMARK							
LOGIC LEVEL H=3.3V L=0V	H	POWER ON										
	L	SHUTDOWN										
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	/INT	O	EXTERNAL INTERRUPT TO THE HOST	TOUCH PANEL								

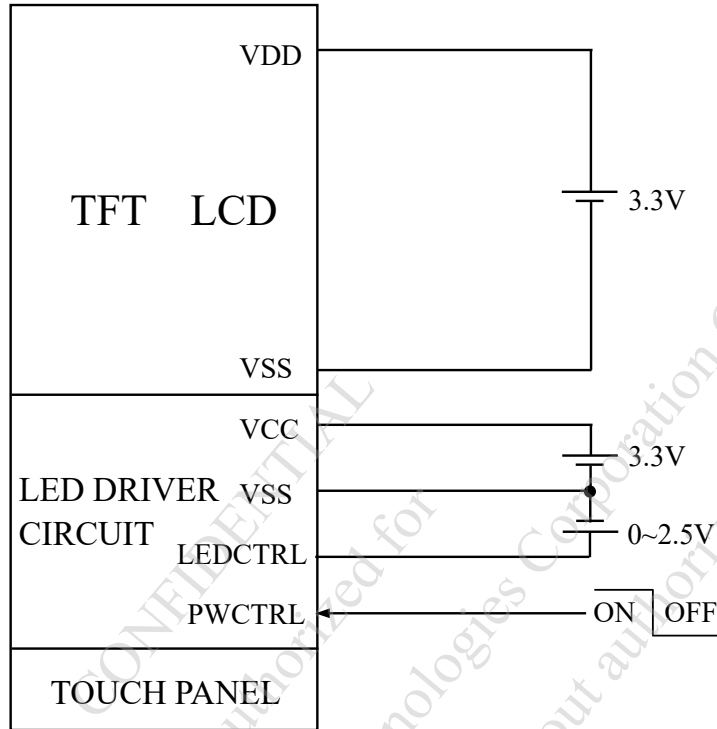
PIN NO.	SYMBOL	I/O/P	FUNCTION
36	LEDCTRL	I	BRIGHTNESS CONTROL FOR LED BACKLIGHT
37	SCL	I/O	I2C CLOCK INPUT
38	NC	—	NON CONNECTION
39	SDA	I/O	I2C DATA INPUT AND OUTPUT
40	NC	—	NON CONNECTION

TOUCH PANEL

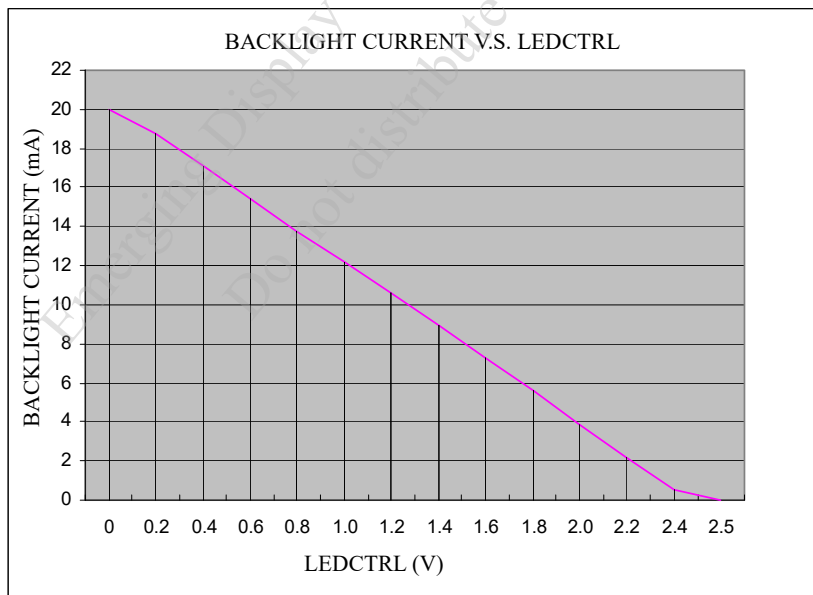
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11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



11.2 THE BRIGHTNESS CONTROLLED BY BACKLIGHT CURRENT OF LEDCTRL



NOTE : LEDCTRL 0~2.5±0.15V

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.

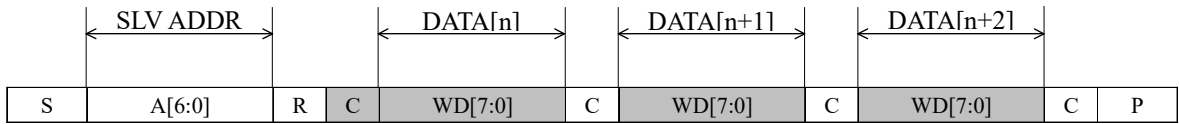
12.2 HARDNESS

ITEM	DESCRIPTION
SURFACE HARDNESS	7H (MIN.)

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12.3 PROTOCOL

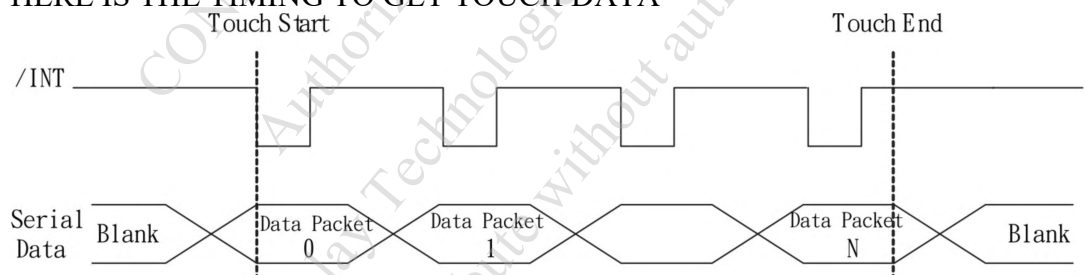
12.3.1 I2C READ



CHARACTER	DESCRIPTION
S	I2C START OR I2C RESTART
A[6:0]	SLAVE ADDRESS, THE VALUE CAN BE CUSTOMIZED
R	OPERATOR BYTE, SHOULD BE 1'b1, STANDS FOR READ
C	ACK SIGNAL
P	STOP SIGNAL (STOP SIGNAL IS OPTIONAL, RESTART SIGNAL IS ALSO OK FOR NEXT PACKET)

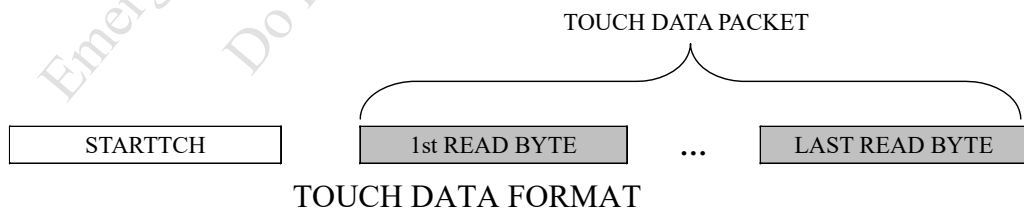
SLAVE ADDRESS=0x38

12.3.2 INTERRUPT SIGNAL FOR CTPM TO HOST
AS FOR STANDARD CTPM, HOST NEED TO USE BOTH INTERRUPT CONTROL SIGNAL AND SERIAL DATA INTERFACE TO GET THE TOUCH DATA.
HERE IS THE TIMING TO GET TOUCH DATA



12.3.3 READ TOUCH DATA PACKET

WE DEFINED A CTPM PERIOD AS EACH CAPACITANCE DATA GATHERING AND DATA PROCESS, IN EACH CTPM, IF THERE IS A TOUCH DETECTS, THERE WILL WE A FAME OF TOUCH DATA. HOST CAN GET THE SPECIFIED FORMAT TOUCH DATA BY SERIAL DATA INTERFACE.



TOUCH DATA READ PROTOCOL

IN THIS MODE THE CTP IS FULLY FUNCTIONAL AS A TOUCH SCREEN CONTROLLER. READ AND WRITE ACCESS ADDRESS IS JUST LOGICAL ADDRESS WHICH IS NOT ENFORCED BY HARDWARE OR FIRMWARE. HERE IS THE OPERATING MODE REGISTER MAP.

ADDRESS	NAME	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0	HOST ACCESS
02h	TD_STATUS					NUMBER OF TOUCH POINTS[3:0]				R
03h	TOUCH1_XH	1 st EVENT FLAG				1 st TOUCH X POSITION[11:8]				R
04h	TOUCH1_XL	1 st TOUCH X POSITION[7:0]								R
05h	TOUCH1_YH	1 st TOUCH ID[3:0]				1 st TOUCH Y POSITION[11:8]				R
06h	TOUCH1_YL	1 st TOUCH Y POSITION[7:0]								R
07h										
08h										
09h	TOUCH2_XH	2 nd EVENT FLAG				2 nd TOUCH X POSITION[11:8]				R
0Ah	TOUCH2_XL	2 nd TOUCH X POSITION[7:0]								R
0Bh	TOUCH2_YH	2 nd TOUCH ID[3:0]				2 nd TOUCH Y POSITION[11:8]				R
0Ch	TOUCH2_YL	2 nd TOUCH Y POSITION[7:0]								R
0Dh										R
0Eh										R
0Fh	TOUCH3_XH	3 rd EVENT FLAG				3 rd TOUCH X POSITION[11:8]				R
10h	TOUCH3_XL	3 rd TOUCH X POSITION[7:0]								R
11h	TOUCH3_YH	3 rd TOUCH ID[3:0]				3 rd TOUCH Y POSITION[11:8]				R
12h	TOUCH3_YL	3 rd TOUCH Y POSITION[7:0]								R
13h										R
14h										R
15h	TOUCH4_XH	4 th EVENT FLAG				4 th TOUCH X POSITION[11:8]				R
16h	TOUCH4_XL	4 th TOUCH X POSITION[7:0]								R
17h	TOUCH4_YH	4 th TOUCH ID[3:0]				4 th TOUCH Y POSITION[11:8]				R
18h	TOUCH4_YL	4 th TOUCH Y POSITION[7:0]								R
19h										R
1Ah										R
1Bh	TOUCH5_XH	5 th EVENT FLAG				5 th TOUCH X POSITION[11:8]				R
1Ch	TOUCH5_XL	5 th TOUCH X POSITION[7:0]								R
1Dh	TOUCH5_YH	5 th TOUCH ID[3:0]				5 th TOUCH Y POSITION[11:8]				R
1Eh	TOUCH5_YL	5 th TOUCH Y POSITION[7:0]								R
1Fh										R
20h										R
A6h	ID_G_FIRMID	FIRMWARE ID								R

TD_STATUS

THIS REGISTER IS THE TOUCH DATA STATUS REGISTER.

ADDRESS	BIT ADDRESS	REGISTER NAME	DESCRIPTION
02h	3:0	NUMBER OF TOUCH POINTS [3:0]	HOW MANY POINTS DETECTED. 1-5 IS VALID.
	7:4	NONE	NONE

TOUCH_n_XH (n:1-5)

THIS REGISTER DESCRIBES MSB OF THE X COORDINATE OF THE NTH TOUCH POINT AND THE CORRESPONDING EVENT FLAG.

ADDRESS	BIT ADDRESS	REGISTER NAME	DESCRIPTION
03h ~ 1Bh	7:6	EVENT FLAG	00b: PUT DOWN 01b: PUT UP 10b: CONTACT 11b: RESERVED
	5:4	NONE	RESERVED
	3:0	TOUCH X POSITION [11:8]	MSB OF TOUCH X POSITION IN PIXELS

TOUCH_n_XL (n:1-5)

THIS REGISTER DESCRIBES LSB OF THE X COORDINATE OF THE NTH TOUCH POINT.

ADDRESS	BIT ADDRESS	REGISTER NAME	DESCRIPTION
04h ~ 1Ch	7:0	TOUCH X POSITION [7:0]	LSB OF THE TOUCH X POSITION IN PIXELS

TOUCH_n_YH (n:1-5)

THIS REGISTER DESCRIBES MSB OF THE Y COORDINATE OF THE NTH TOUCH POINT AND CORRESPONDING TOUCH ID.

ADDRESS	BIT ADDRESS	REGISTER NAME	DESCRIPTION
05h ~ 1Dh	7:4	TOUCH ID [3:0]	TOUCH ID OF TOUCH POINT
	3:0	TOUCH X POSITION [11:8]	MSB OF TOUCH Y POSITION IN PIXELS

TOUCH_n_YL (n:1-5)

THIS REGISTER DESCRIBES LSB OF THE Y COORDINATE OF THE NTH TOUCH POINT.

ADDRESS	BIT ADDRESS	REGISTER NAME	DESCRIPTION
06h ~ 1Eh	7:0	TOUCH X POSITION [7:0]	LSB OF THE TOUCH Y POSITION IN PIXELS

ID_G_FIRMWARE_ID

THIS REGISTER DESCRIBES THE FIRMWARE ID OF THE APPLICATION

ADDRESS	BIT ADDRESS	REGISTER NAME	DESCRIPTION
A6h	7:0	ID_G_FIRMWARE_ID	FIRMWARE VERSION

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

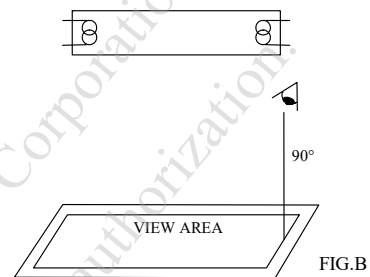
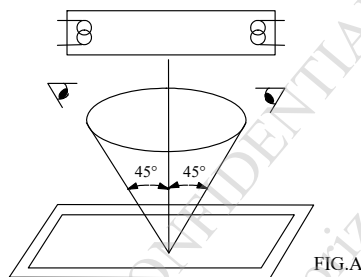
13.2 INSPECTION CONDITIONS

13.2.1 (1)OBSERVATION DISTANCE : 45 ± 5 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 RESPECTS 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 RESPECTS 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		10 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 :

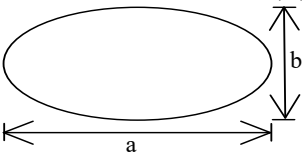
MIL-STD-105E LEVEL II
 NORMAL INSPECTION, SINGLE SAMPLING

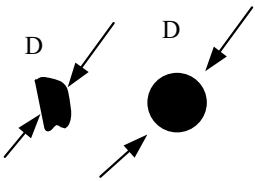
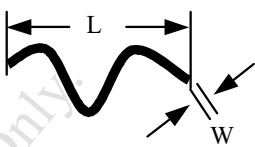
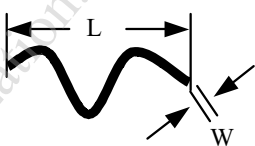
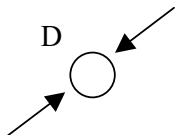
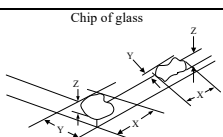
(b)AQL : MAJOR DEFECT : AQL 0.65

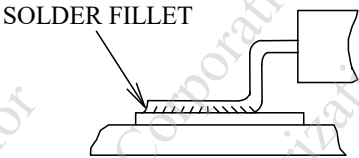
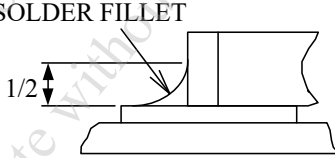
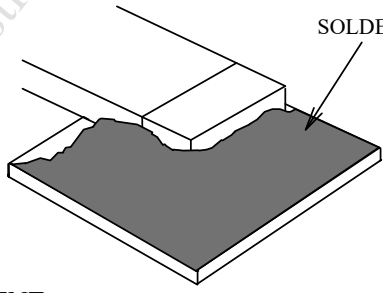
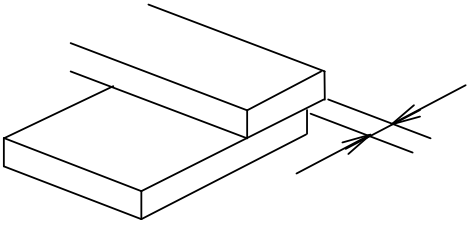
MINOR DEFECT : AQL 1.0

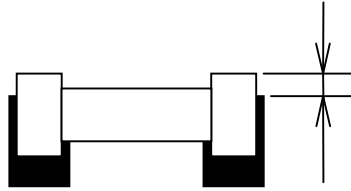
13.3 DEFECTS CLASSIFICATION

TYPE OF DEFECT	INSPECTION ITEM	DEFECT FEATURE	AQL
MAJOR DEFECT	1.DISPLAY ON	<ul style="list-style-type: none"> • DEFECT TO MISS SPECIFIED DISPLAY FUNCTION, FOR ALL AND SPECIFIED DOTS EX: DISCONNECTION, SHORT CIRCUIT ETC 	0.65
	2.BACKLIGHT	<ul style="list-style-type: none"> • NO LIGHT • FLICKERING AND OTHER ABNORMAL ILLUMINATION 	
	3.DIMENSIONS	<ul style="list-style-type: none"> • SUBJECT TO INDIVIDUAL ACCEPTANCE SPECIFICATIONS 	
MINOR DEFECT	1.DISPLAY ZONE	<ul style="list-style-type: none"> • BLACK/WHITE SPOT • BUBBLES ON POLARIZER • NEWTON RING • BLACK/WHITE LINE • SCRATCH • CONTAMINATION • 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	<p>1. INSPECTION PATTERN: FULL WHITE, FULL BLACK, RED, GREEN AND BLUE SCREENS.</p> <p>2.</p> <table border="1"> <thead> <tr> <th>ITEMS</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td>BRIGHT DOT</td> <td>$N \leq 2$</td> </tr> <tr> <td>DARK DOT</td> <td>$N \leq 3$</td> </tr> <tr> <td>TOTAL BRIGHT AND DARK DOTS</td> <td>$N \leq 4$</td> </tr> </tbody> </table> <p>NOTE :</p> <p>(1)THE DEFINITION OF DOT :</p> <p>THE SIZE OF A DEFECTIVE DOT OVER 1/2 OF WHOLE DOT IS REGARDED AS ONE DEFECTIVE DOT.</p> <p>(2)BRIGHT DOT :</p> <p>DOTS APPEAR BRIGHT AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER BLACK PATTERN. THE BRIGHT DOT DEFECT MUST BE VISIBLE THROUGH 6% ND FILTER.</p> <p>(3)DARK DOT :</p> <p>DOTS APPEAR DARK AND UNCHANGED IN SIZE IN WHICH LCD PANEL IS DISPLAYING UNDER PURE RED, GREEN, BLUE PICTURE.</p>	ITEMS	PERMISSIBLE NO.	BRIGHT DOT	$N \leq 2$	DARK DOT	$N \leq 3$	TOTAL BRIGHT AND DARK DOTS	$N \leq 4$												
ITEMS	PERMISSIBLE NO.																					
BRIGHT DOT	$N \leq 2$																					
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4	BUBBLES ON POLARIZER /SURFACE STAINS /DIRT/CF FAIL/SPOT	<table border="1"> <thead> <tr> <th></th> <th>AVERAGE DIAMETER (mm) : D</th> <th>PERMISSIBLE NO.</th> </tr> </thead> <tbody> <tr> <td rowspan="3">BUBBLE ON POLARIZER</td> <td>$D \leq 0.25$</td> <td>IGNORE</td> </tr> <tr> <td>$0.25 < D \leq 0.5$</td> <td>$N \leq 5$</td> </tr> <tr> <td>$0.5 < D$</td> <td>0</td> </tr> <tr> <td rowspan="2">SURFACE STAINS / DIRT ON POLARIZER</td> <td>$D < 0.1$</td> <td>IGNORE</td> </tr> <tr> <td>$0.1 < D \leq 0.3$</td> <td>$N \leq 3$</td> </tr> <tr> <td rowspan="2">CF FAIL / SPOT</td> <td>$D < 0.1$</td> <td>IGNORE</td> </tr> <tr> <td>$0.1 < D \leq 0.3$</td> <td>$N \leq 3$</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> 		AVERAGE DIAMETER (mm) : D	PERMISSIBLE NO.	BUBBLE ON POLARIZER	$D \leq 0.25$	IGNORE	$0.25 < D \leq 0.5$	$N \leq 5$	$0.5 < D$	0	SURFACE STAINS / DIRT ON POLARIZER	$D < 0.1$	IGNORE	$0.1 < D \leq 0.3$	$N \leq 3$	CF FAIL / SPOT	$D < 0.1$	IGNORE	$0.1 < D \leq 0.3$	$N \leq 3$
	AVERAGE DIAMETER (mm) : D	PERMISSIBLE NO.																				
BUBBLE ON POLARIZER	$D \leq 0.25$	IGNORE																				
	$0.25 < D \leq 0.5$	$N \leq 5$																				
	$0.5 < D$	0																				
SURFACE STAINS / DIRT ON POLARIZER	$D < 0.1$	IGNORE																				
	$0.1 < D \leq 0.3$	$N \leq 3$																				
CF FAIL / SPOT	$D < 0.1$	IGNORE																				
	$0.1 < D \leq 0.3$	$N \leq 3$																				

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>$D \leq 0.15$</td> <td>IGNORE</td> </tr> <tr> <td>$0.15 < D \leq 0.5$</td> <td>4</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 5mm APART.</p>	SIZE D	PERMISSIBLE NO.	$D \leq 0.15$	IGNORE	$0.15 < D \leq 0.5$	4	$D > 0.5$	0			
SIZE D	PERMISSIBLE NO.												
$D \leq 0.15$	IGNORE												
$0.15 < D \leq 0.5$	4												
$D > 0.5$	0												
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>$W \leq 0.05$</td> <td>IGNORE</td> </tr> <tr> <td>$0.05 < W \leq 0.08, L \leq 5$</td> <td>3</td> </tr> <tr> <td>$0.08 < W \leq 0.1, L \leq 3$</td> <td>3</td> </tr> <tr> <td>$W > 0.1$</td> <td>0</td> </tr> </tbody> </table> <p>NOTE (1) : THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 5mm APART.</p>	SIZE W & L	PERMISSIBLE NO.	$W \leq 0.05$	IGNORE	$0.05 < W \leq 0.08, L \leq 5$	3	$0.08 < W \leq 0.1, L \leq 3$	3	$W > 0.1$	0	
SIZE W & L	PERMISSIBLE NO.												
$W \leq 0.05$	IGNORE												
$0.05 < W \leq 0.08, L \leq 5$	3												
$0.08 < W \leq 0.1, L \leq 3$	3												
$W > 0.1$	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>$W \leq 0.05$</td> <td>IGNORE</td> </tr> <tr> <td>$0.05 < W \leq 0.08, L \leq 5$</td> <td>2</td> </tr> <tr> <td>$0.08 < W \leq 0.1, L \leq 3$</td> <td>2</td> </tr> <tr> <td>$W > 0.1$</td> <td>0</td> </tr> </tbody> </table> <p>NOTE (1) : THE DISTANCE BETWEEN DEFECTS SHOULD BE MORE THAN 5mm APART.</p>	SIZE W & L	PERMISSIBLE NO.	$W \leq 0.05$	IGNORE	$0.05 < W \leq 0.08, L \leq 5$	2	$0.08 < W \leq 0.1, L \leq 3$	2	$W > 0.1$	0	
SIZE W & L	PERMISSIBLE NO.												
$W \leq 0.05$	IGNORE												
$0.05 < W \leq 0.08, L \leq 5$	2												
$0.08 < W \leq 0.1, L \leq 3$	2												
$W > 0.1$	0												
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.												
$D \leq 0.2$	IGNORE												
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9	CHIPPING	<table border="1"> <tr> <td>CORNER</td> <td>$X + Y \leq 4\text{mm} \cdot Z \leq t$ (t : THICKNESS)</td> </tr> <tr> <td>EDGE</td> <td>$X \leq 6\text{mm} , Y \leq 1\text{mm} , Z < t$ (t : THICKNESS)</td> </tr> </table>	CORNER	$X + Y \leq 4\text{mm} \cdot Z \leq t$ (t : THICKNESS)	EDGE	$X \leq 6\text{mm} , Y \leq 1\text{mm} , Z < t$ (t : THICKNESS)	<p>Chip of glass</p> 						
CORNER	$X + Y \leq 4\text{mm} \cdot Z \leq t$ (t : THICKNESS)												
EDGE	$X \leq 6\text{mm} , Y \leq 1\text{mm} , Z < t$ (t : THICKNESS)												
10	CRACKED GLASS	NOT ACCEPTABLE											
11	LINE DEFECT ON DISPLAY	OBVIOUS VERTICAL OR HORIZONTAL LINE DEFECT IS NOT ALLOWED.											
12	MURA ON DISPLAY	IT'S ACCEPTABLE, IF MURA IS SLIGHT VISIBLE THROUGH 6% 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  <ul style="list-style-type: none"> · 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 

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

NOTE :

- FOR ANY SPOTS OR LINES, WHICH ARE NOT OBSERVED UNDER APPROPRIATE PANEL OPERATING CONDITION ARE DEEMED ACCEPTABLE.
- THE FOREIGN MATERIALS THAT CAN BE BLOWN OUT BY AIR AND REMOVED BY WET CLEANING ARE NOT REGARDED AS DEFECTS.

14. RELIABILITY TEST

14.1 STANDARD SPECIFICATIONS FOR RELIABILITY OF LCD MODULE

NO.	ITEM	DESCRIPTION
1	HIGH TEMPERATURE OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +70°C FOR 240 HRS
2	LOW TEMPERATURE OPERATION	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -20°C FOR 240 HRS
3	HIGH TEMPERATURE STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT +80°C FOR 240 HRS
4	LOW TEMPERATURE STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT -30°C FOR 240 HRS
5	HIGH TEMPERATURE /HUMIDITY TEST STORAGE	THE SAMPLE SHOULD BE ALLOWED TO STAND AT 60°C , 90% RH 240 HRS
6	THERMAL SHOCK (NOT OPERATED)	<p>THE SAMPLE SHOULD BE ALLOWED TO STAND THE FOLLOWING 10 CYCLES OF OPERATION:</p>
7	ESD (ELECTROSTATIC DISCHARGE) (NOT OPERATED)	AIR DISCHARGE ± 12KV CONTACT DISCHARGE ± 8KV (ACCORDING TO IEC-61000-4-2)

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.

14.2 TESTING CONDITIONS AND INSPECTION CRITERIA

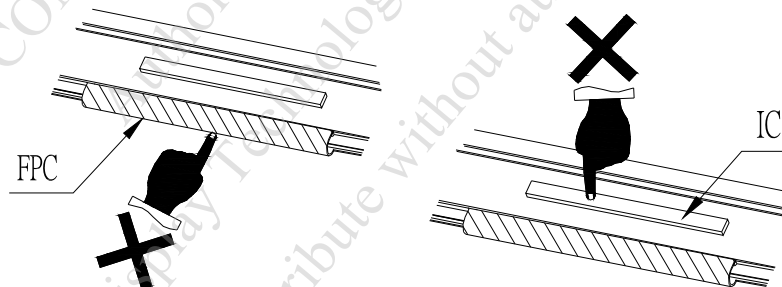
FOR THE FINAL TEST THE TESTING SAMPLE MUST BE STORED AT ROOM TEMPERATURE FOR 24 HOURS, STANDARD SPECIFICATIONS FOR RELIABILITY HAVE BEEN EXECUTED IN ORDER TO ENSURE STABILITY.

NO.	ITEM	TEST MODEL	INSPECTION CRITERIA
1	CURRENT CONSUMPTION	REFER TO SPECIFICATION	THE CURRENT CONSUMPTION SHOULD CONFORM TO THE PRODUCT SPECIFICATION.
2	CONTRAST	REFER TO SPECIFICATION	AFTER THE TESTS HAVE BEEN EXECUTED, THE CONTRAST MUST BE LARGER THAN HALF OF ITS INITIAL VALUE PRIOR TO THE TESTS.
3	APPEARANCE	VISUAL INSPECTION	DEFECT FREE

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 HANDLING

- 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 ATTACHED 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.