* Records of Revision *

Rev.	Page	Description of changes	Date	prepared by
o	All	Original Release	2010.8.25	Tang Jie

☑ 一般事项　　☐ 特殊事项

特殊事项内容：

* Contents *

1. Features

The features of BTL201722-397L are as follows

* Display mode : TFT 262K Colors,Transmissive,Normally White

* Driving Condition : 176x3Ch-Source / 220Ch-Gate

* Connection : Soldering Type

* LCD Driver & Control IC
  : ILI9225B(ILITECH)

* Back Light : White LED Back Light (3 Chips in Parallel)

* MPU Interface : 80-Series, 16bits Parallel Data Bus

* Type of Surface Contion
  : Clear Type

2. Mechanical Specifications

Item		Specification	Unit
Resolution	Main	176(x RGB) x 220	Dot
	Sub	NA	
LCM Outline Demension		37.68X51.30X2.2(TYP)	mm
Active Area (W × H)	Main	31.68X39.60	mm
	Sub	NA	
Pixel Pitch (W x H)	Main	0.18X0.18	mm
	Sub	NA	
Viewing Direction (Human Eye)	Main	6	O'clock
	Sub	NA	
Gray Scale Inversion Direction (Contrast Ratio)	Main	12	O'clock (Rubbing Direction)
	Sub	NA	
Weight		About 8	g

3. Absolute Maximum Ratings

(Ta=25℃ Note1)

Items	Symbol	Min.	Max.	Unit	Remark
Logic voltage	I_{OVCC}	-0.3	4.6	V	
Analog voltage	V_{CI}	-0.3	4.6	V	
Input signal voltage	V_{IN}	-0.3	VCC+0.3	V	
LED forward current	I_{LED}	-	20	mA	For each LED
Operation temeprature	T_{OPR}	-40	85	℃	
Storage temperature	T_{STG}	-55	110	℃	
Humidity (ambient		Ta≤60℃	90% RH Max.		

Note1 : Device is subject to be damaged permanently,
if stresses beyond those absolute maximum ratings listed above.

4. Electrical Characteristics

Main Ta=25℃

Items		Symbol	Min.	Typ.	Max.	Unit	Remark
Logic voltage		I_{OVCC}	1.65	1.8	3.3	V	
Analog(Power) voltage		V_{CC}	2.5	2.8	3.3	V	
Gate voltage	High level	V_{GH}	12	-	18	V	Note 1
	Low level	V_{GL}	-10	-	-6	V	
Input signal voltage	High level	V_{IH}	0.7×IOVcc	-	IOVcc	V	
	Low level	V_{IL}	-0.3	-	0.3×IOVcc	V	
current consumption		Icc	-	5.5	8	mA	Note 2

Note 1) The value can be adjusted by software to optimize display quality
Note 2) Display Black Pattern

5. Recommended Software Setting Value (LDI：ILI9225B)

Initial Code

INDEX	DATA
Hardware Reset	
DELAY 50ms	
0001	011C
0002	0100
0003	1030
0008	0808
000C	0000
000F	0A01
0020	0000
0021	0000
Power On Sequence	
DELAY 50ms	
0010	0A00
0011	103B
DELAY 50ms	
0012	6121
0013	006F
0014	4C52
Set GRAM Area	
0030	0000
0031	00DB
0032	0000
0033	0000
0034	00DB
0035	0000
0036	00AF
0037	0000
0038	00DB
0039	0000
GAMMA Correction	
0050	0000
0051	0408
0052	0807
0053	000A
0054	0B08
0055	0A0A
0056	0000
0057	0A00
0058	1005
0059	0710
Panel Control	
DELAY 50ms	
0007	1017

Into Standby Mode

INDEX	DATA
0007	0000
DELAY 50ms	
0010	0A01

Exit Standby Mode

0010	0A00
DELAY 50ms	
0007	1017

Windows Display Setting

INDEX	DATA
0x39	Column Address Start
0x38	Column Address End
0x37	Row Address Start
0x36	Row Address End
0x22	display data…

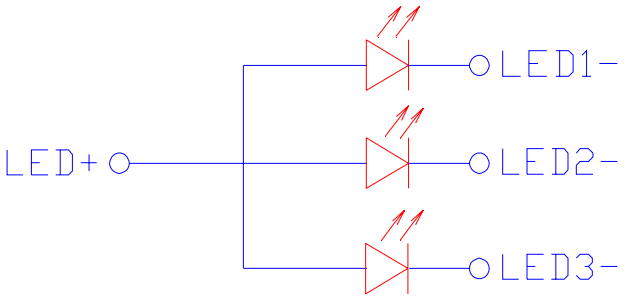
NOTE: BOE requires the customer to follow the above instructions strictly. If customer would like to change the above instructions,the customer should inform BOE and get re-check from BOE, or the customer will be responsible for any unexpected result because of the change.

6. Back Light System Characteristics

Ta=25℃

Items	Symbol	Min.	Typ.	Max.	Unit	Remark
Forward current	**If**	**-**	**15**	**20**	**mA**	**Note1**
Forward voltage	**Vf**	**3.0**	**-**	**3.4**	**V**	**Note1**
B/L Power consumption	**P_{BL}**	**-**	**-**	**204**	**mW**	**Note2**

Note 1: The Driving conditon is defined for each LED chip.
Note 2: The B/L Power consumption is defined for the backlight module.the schematic drawing of the backlight module as the figure.



Ref. Total power consumpation(max) depends on LED current/ LED driver efficiency, etc.

7. Optical Characteristics

Transmissive Mode

Ta=25℃

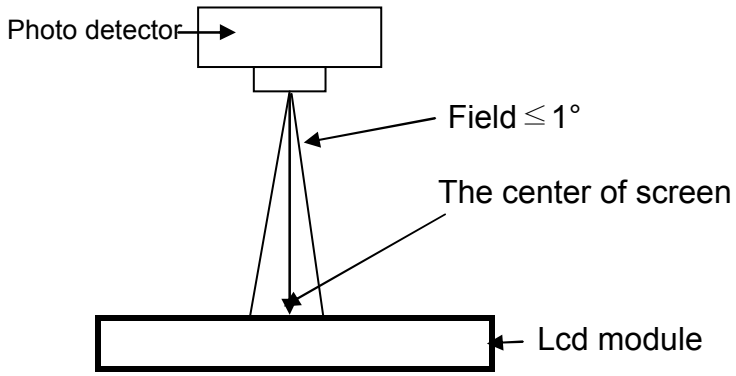
Item		Symbol		Min.	Typ.	Max.	Unit	Condition	Note
Viewing Angle		θ	Ø=0° (X1)	-	45	-	deg.	Cr > 10	Note2
			Ø=180° (X2)	-	45	-			
			Ø=90° (Y1)	-	50	-			
			Ø=270° (Y2)	-	20	-			
Contrast ratio (transmissive)		Cr		140	260	-	-	θ = 0 Ø = 0	Note1 Note4
Response Time		Tr + Tf		-	25	-	ms	θ = 0 Ø = 0	Note3
CIE Coordi - nate	R	(x,y)		0.60，0.28	0.64，0.32	0.68，0.36		θ = 0 Ø = 0	
	G	(x,y)		0.29，0.52	0.33，0.56	0.37，0.60			
	B	(x,y)		0.10，0.03	0.14，0.07	0.18，0.11			
	W	(x,y)		0.24，0.26	0.28，0.30	0.32，0.34			
Brightness		L		160	200	-	cd/m2	15mA/LED	Note5
Uniformity				70	-	-		15mA/LED	Note6

* Ø = 0 ° , Ø = 90 ° ,Ø = 180 ° ,Ø = 270 ° means viewing direction.

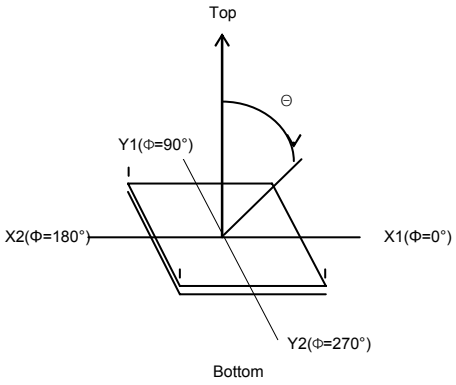
* B/L is turned on.

The optical characteristics should be measured in dark room,and after 5 minutes operation, the measurment begin.

Note1. Definition of Measure System

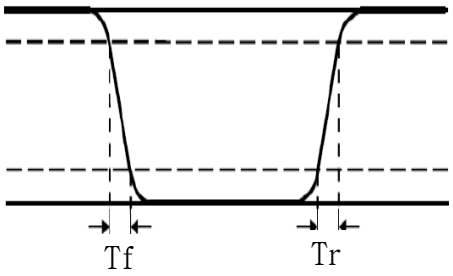


Note2. Definition of Angle Θ.



Note3. Definition of Response Time

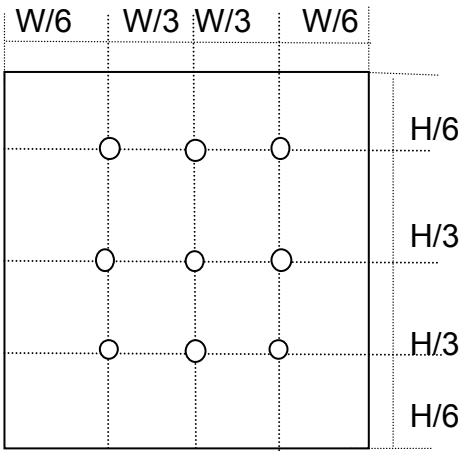
White(TFT off)	Black(TFT on)	White(TFT off)



Note4.definition of contrast ratio

$$Cr = \frac{\text{Liuminance of LCD white state}}{\text{Liuminance of LCD Black state}}$$

Note 5. Measuring Point(9 Points) (WxH)

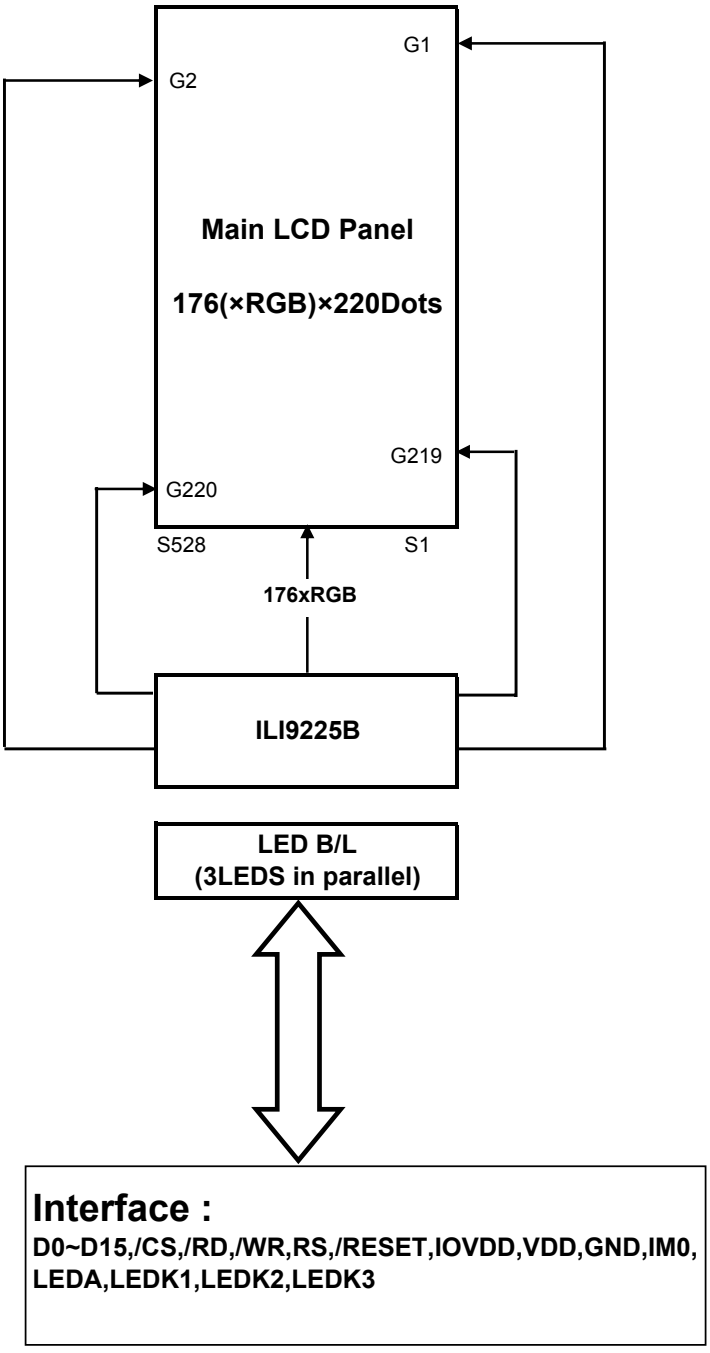


Rating is defined as the average brightness inside the viewing area

Note 6. definition of Uniformity

$$\text{Uniformity} = \frac{\text{max. Liuminance of measurede point}}{\text{max. Liuminance of measurede poin}}$$

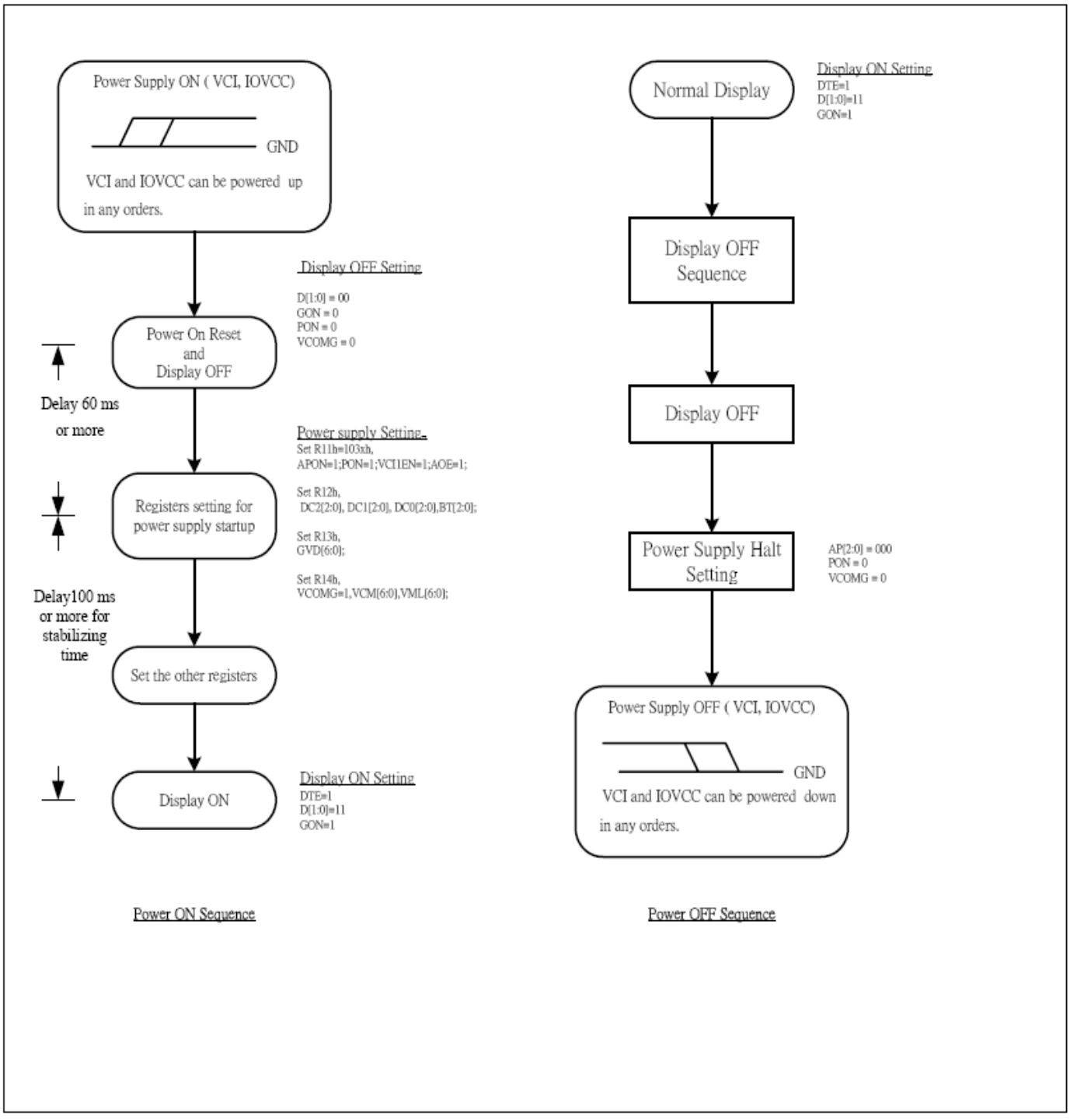
8. Block Diagram



9. Interface Pin Assignment

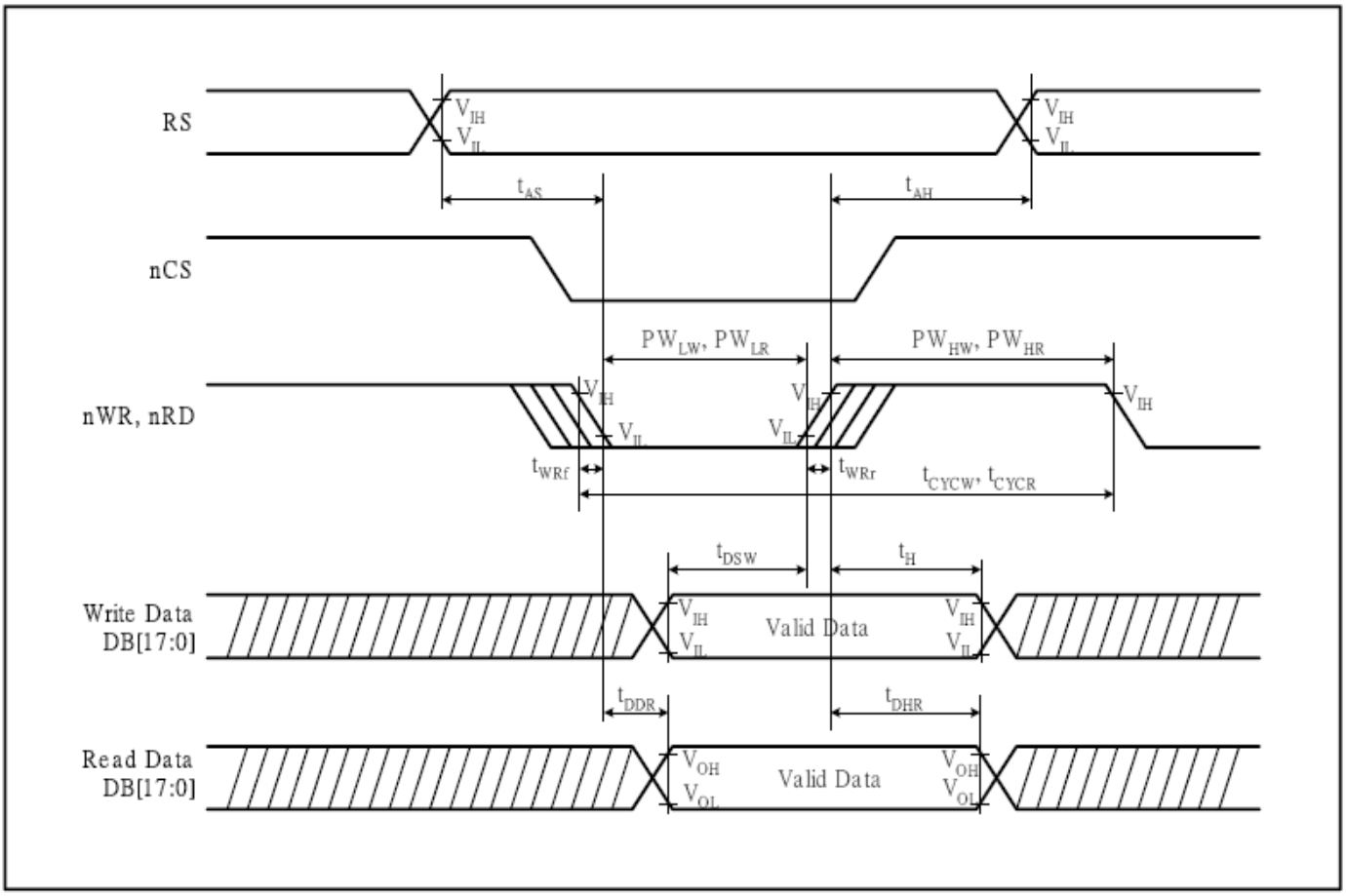
No	Symbol	Description
1	DB15	Bi-directional (I/O) Data Line
2	DB14	Bi-directional (I/O) Data Line
3	DB13	Bi-directional (I/O) Data Line
4	DB12	Bi-directional (I/O) Data Line
5	DB11	Bi-directional (I/O) Data Line
6	DB10	Bi-directional (I/O) Data Line
7	DB9	Bi-directional (I/O) Data Line
8	DB8	Bi-directional (I/O) Data Line
9	GND	Ground
10	DB7	Bi-directional (I/O) Data Line
11	DB6	Bi-directional (I/O) Data Line
12	DB5	Bi-directional (I/O) Data Line
13	DB4	Bi-directional (I/O) Data Line
14	DB3	Bi-directional (I/O) Data Line
15	DB2	Bi-directional (I/O) Data Line
16	DB1	Bi-directional (I/O) Data Line
17	DB0	Bi-directional (I/O) Data Line
18	IOVDD	Power Supply to the I/O interface
19	VDD	Power Supply to the analog circuit
20	RD	Read Signal (low active)
21	WR	Write Signal (low active)
22	RS	RS Signal (RS=0 : instruction ; RS=1 : data)
23	CS	Main Chip select Signal (low active)
24	RESET	Hard Reset (low active)
25	IM0	Interface Selection IM0=1 : 8bit ; IM0=0 : 16bit
26	GND	Ground
27	LED_A	LED Anode
28	LED_K1	LED Cathode
29	LED_K2	LED Cathode
30	LED_K3	LED Cathode
31	Y+	No Used
32	Y-	No Used
33	X+	No Used
34	X-	No Used
35	NC	No Used
36	NC	No Used

10. Power Supply Sequence



11. Read/Write Timing characteristics (80 series MPU)

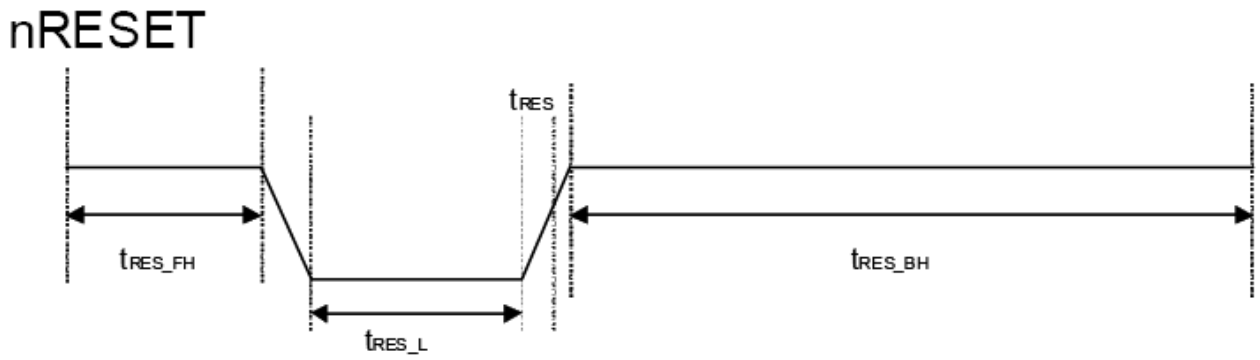
1）Read/Write Timing



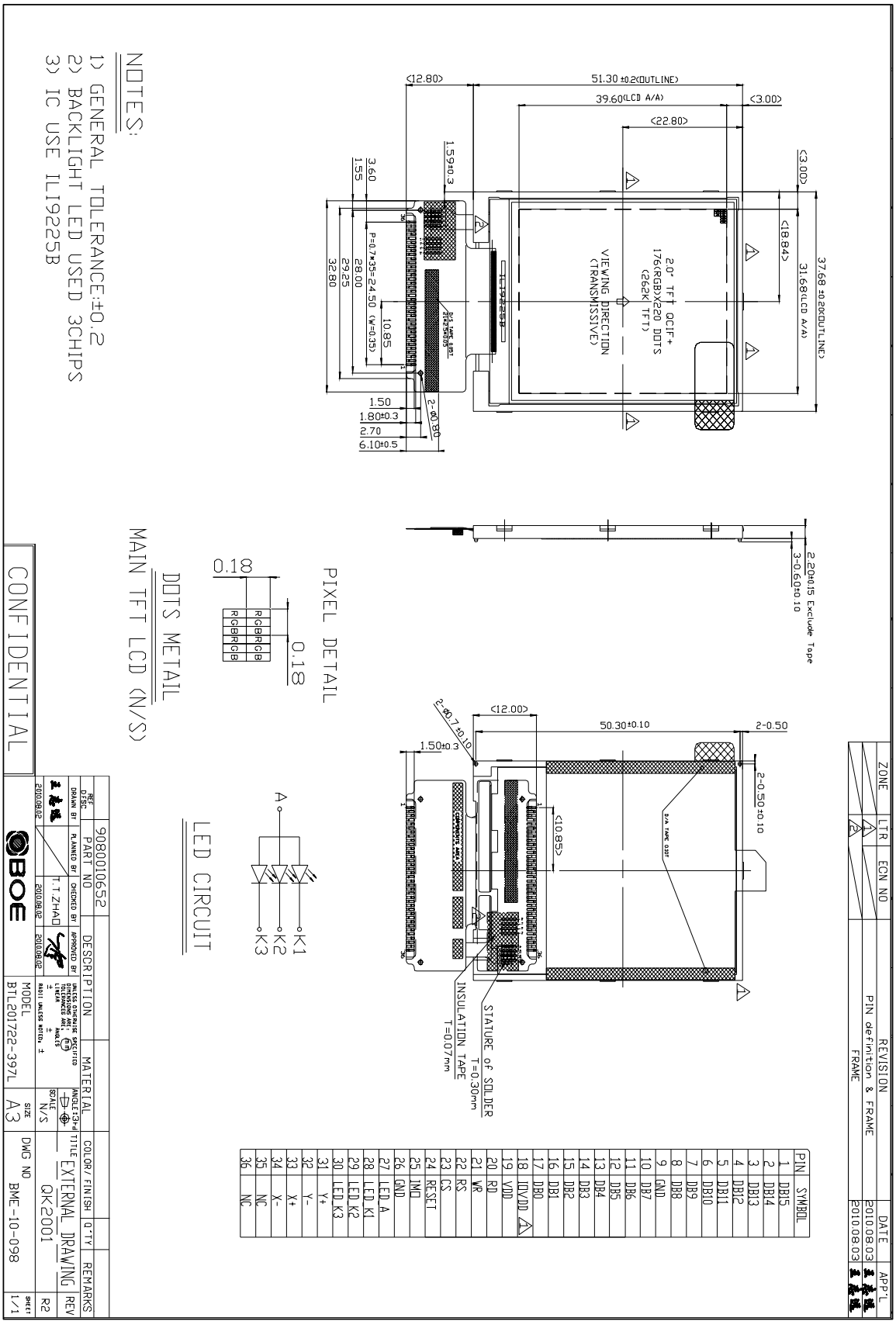
Item		Symbol	Unit	Min.	Max.	Test Condition
Bus cycle time	Write	t_{CYCW}	ns	70	-	-
	Read	t_{CYCR}	ns	300	-	-
Write low-level pulse width		PW_{LW}	ns	15	500	-
Write high-level pulse width		PW_{HW}	ns	15	-	-
Read low-level pulse width		PW_{LR}	ns	150	-	-
Read high-level pulse width		PW_{HR}	ns	150	-	
Write / Read rise / fall time		t_{WRr}/t_{WRf}	ns	-	15	
Setup time	Write (RS to nCS, E/nWR)	t_{AS}	ns	10	-	
	Read (RS to nCS, RW/nRD)			5	-	
Address hold time		t_{AH}	ns	5	-	
Write data set up time		t_{DSW}	ns	10	-	
Write data hold time		t_H	ns	15	-	
Read data delay time		t_{DDR}	ns	-	100	
Read data hold time		t_{DHR}	ns	5	-	

2) Reset Timing characteristics

Item	Symbol	Unit	Min.	Typ.	Max.
Reset front high-level width	t_{RES_FH}	ms	1	-	-
Reset low-level width	t_{RES_L}	ms	10		
Reset back high-level width	t_{RES_BH}	ms	50	-	-
Reset rise time	t_{rRES}	µs			10



12. External Dimension



13. COLOR LCD MODULE NUMBERING SYSTEM

B	T	L	2	0	1	7	2	2	-			3	9	7	L		
(1)	(2)	(3)	(4)			(5)				(6)			(7)			(8)	(9)	(10)

(1) B：BHL

(2) Drive System

C : CSTN T : TFT E : OLED M：MONO

(3) Product Status

L：LCD Model F：FOG Model G：COG Model P：PANEL Model C：CELL Model

(4) Display size(精确到小数点后1位,四舍五入）

EX) 2.22 inch:22 1.76 inch:18 2.0 inch:20 10.1inch:A1

1.9 inch:19 1.12 inch:11 1.8 inch:18 15.5inch:F5

(5) Resolution

Number of Row Dots * Number of column Dots(前两位有效）

EX) 128 * 128 = 1212 96 * 64 = 9664 128 * 160 = 1216 101 * 80 = 1080

176 * 220 =1722 128 * 96 = 1296 320 * 240 =3224 1024*576 =1057

(6) Viewing Direction

Nil: 6 H U: 12 H L: 9 H R: 3 H W: Wide view E: 其他

(7) Serial Number (*001-9999：按照产品状态，各类产品序列号实行大排行处理, *为0时省略不写)

(8) Back Light

Nil:Without backlight + Reflective H:CCFL + Translective

T:Without backlight + Transflective E:LED Frontlight + Reflective

F:CCFL Frontlight + Reflective D:LED + Transflective

L:LED + Transmissive

(9)DUAL LCD

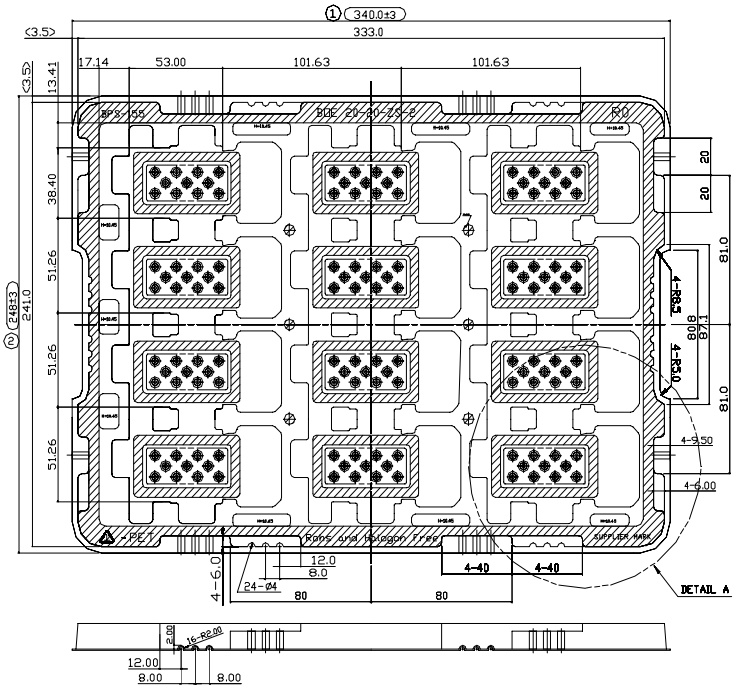
Nil: Single LCD M:MONO C:CSTN T:TFT O:OLED

(10)TOUCH PANEL

Nil:Without TP P:with TP

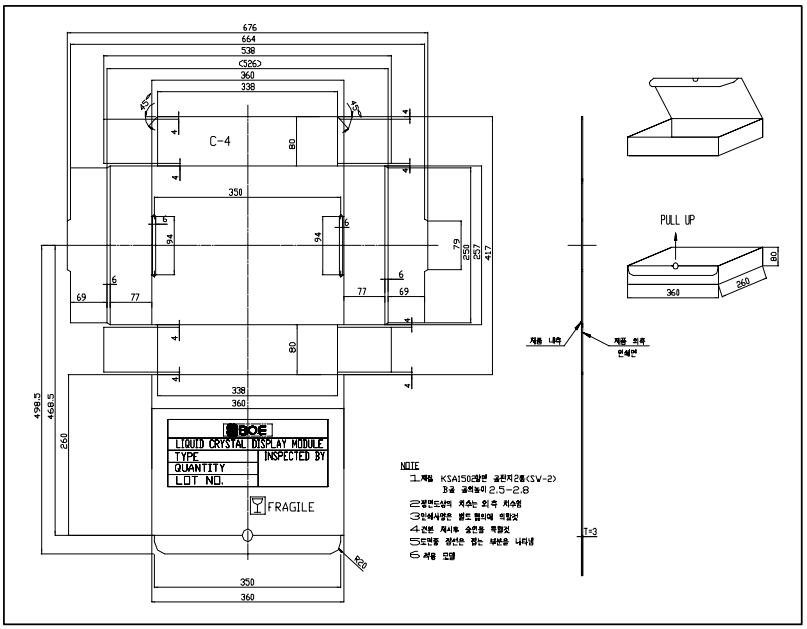
14. Package Terms

1、Tray Size
L:340mm
W:248mm
（**12pcs LCM/Tray**）



Tray Drawing

2、Inner BOX Size
L:360mm
W:260mm
H:80mm
（7pcs Tray）/ Inner Box）



Inner Box Drawing

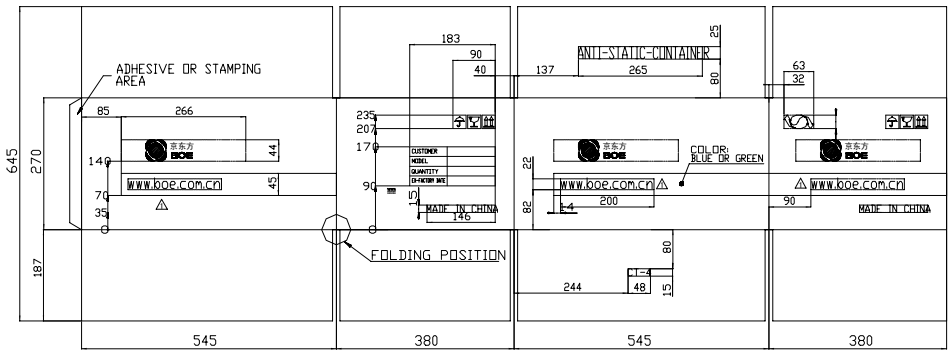
3、Out BOX Size

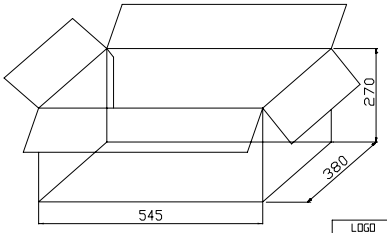
L：545mm

W：380mm

H：270mm

（6pcs Inner / Out）

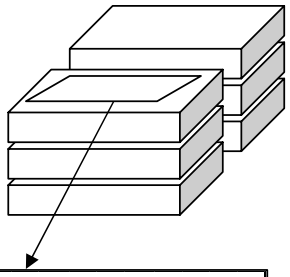




LOGO	COLOR
BOE	BLUE OR GREEN
WWW.BOE.COM.CN	CLEARNESS
OTHERS	BLUE OR GREEN

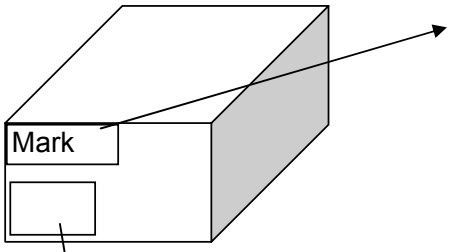
NOTE
1.MATERIAL: KSA 1531,DW2(T=8mm)
2.DRAWING DIMESIONS ARE EQUAL TO OUTSIDE DIMENSION.
3.INNER BOX(C-4) ARRANGEMENT: 3STEPS X?2ROWS
4.MARKS ARE REFER TO SEPERATE CONSULTATION.

4、Packing label content



BOE		
LIQUID CRYSTAL DISPLAY MODULE		
TYPE		INSPECTED BY
QUANTITY	EA	
LOT NO		

Inner Box



BOE			
CUSTOMER		Q'TY	
MODEL		DATE	YYYY-MM-DD
RUN NO		LOC CODE	
ORIGIN		(QA)	

OUT BOX

Custmer Address
Product No.
P/O No.
Lot No.
Box No.

Mark Item

5、Packing notice

[1]Sub LCD should be placed upwardly while in the tray.

[2] Every seven full trays with a blank one while twining twice on both sides by adhesive tape.

[3].Every tray should be put crossedly.

6、Product label

[1] There should be Logo and product modle of BOE on FPC ASS'Y.

7、Packing Q'ty list

	INNER BOX	TRAY	MODULE
OUT BOX	6	42	432
INNER BOX	1	7	72
TRAY	-	1	12

1.LCD Module Out-Going Quality Level

(1.0) Purpose

The LCD specification provides outgoing provision and its expected quality level based on our outgoing inspection of LCD.

(2.0) Applicable Scope

The LCD specification is applicable to the arrangement in regard to outgoing Inspection and quality assurance after it.

(3.0) Quality Specification

(3.1) Quality Level

The quality level of BHL&BMDT are based on GB/T2828.1-2003, Apply Level II, normal inspection by single sampling.

Rank	Item	AQL	Note
Major(MA)	Parts Short, Parts Mounting Back Light, Open Solder Bridging Outside Dimension Solder Ball, Cold Solder	0.65	
Minor (MI)	Stains on LCD Panel Surface Color Variation Stains, Scratchs, Foreign Substance, Spots, Air Bubbles, Parts Alignment	1.0	

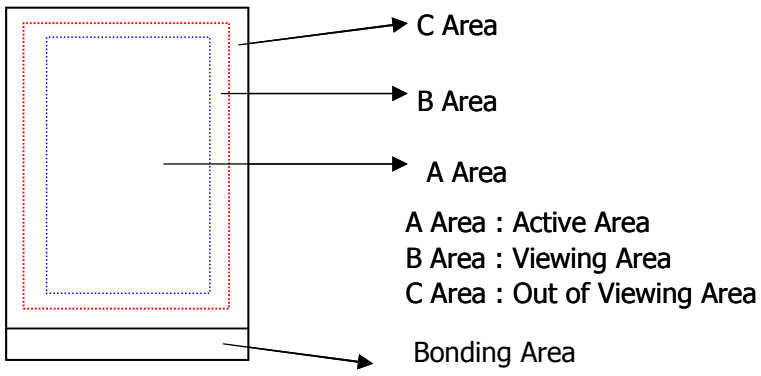
(3.2) Appearance Standards

1) Inspection Conditions

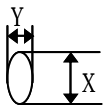
The inspection shall be applied under 20W white fluorescent lamp light at a distance between 400-500mm, with the eyes 300mm away from products and and the angle of view within 30º to perpendicular line.

The mobile lens should be fixed on when doing inspection in case the mobile with len

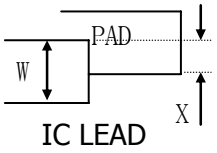
2) Definition of the Area

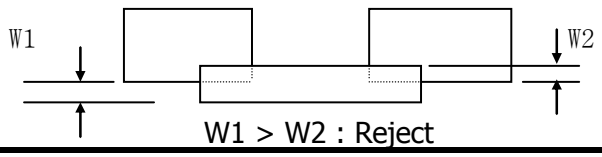


(3.3) Apperance Spec

<table>
<tr><th>No</th><th>Item</th><th>Criteria</th><th>Rank</th><th>Remark</th></tr>
<tr><td>1</td><td>Parts Short</td><td>Not allowed</td><td>MA</td><td></td></tr>
<tr><td>2</td><td>Solder Bridging</td><td>Any bridging between components,except common circuit, is not allowed</td><td>MA</td><td></td></tr>
<tr><td>3</td><td>Outside Dimension</td><td>Drawing & specification must be within permitable tolerance</td><td>MA</td><td></td></tr>
<tr><td>4</td><td>Open</td><td>Not allowed</td><td>MA</td><td></td></tr>
<tr><td>5</td><td>Cold Solder</td><td>Not allowed</td><td>MA</td><td rowspan="4"> 
Diameter
(X + Y)/2</td></tr>
<tr><td>6</td><td>Stains On
LCD Panel Surface</td><td>Stains which can be wiped off with soft cloth are counted as defect

Stains which can't be removed even with soft cloth are not allowed</td><td>MI</td></tr>
<tr><td>7</td><td>Back Light</td><td>No light and short of light and abnormal lighting are not allowed</td><td>MA</td></tr>
<tr><td>8</td><td>Air Bubles Between Glass & Polarizer (Polarizer Defects)</td><td>
<table>
<tr><th rowspan="2">Area
Dimension**</th><th colspan="2">Acceptable Q'ty</th><th rowspan="2">Remark</th></tr>
<tr><th>A Area</th><th>B Area</th></tr>
<tr><td>Φ ≤ 0.15</td><td colspan="2">Ignore</td><td rowspan="5"></td></tr>
<tr><td>0.15 < Φ ≤ 0.30</td><td>3</td><td>Ignore</td></tr>
<tr><td>0.30 < Φ ≤ 0.50</td><td>2</td><td>Ignore</td></tr>
<tr><td>0.50 < Φ ≤ 0.70</td><td>1</td><td>Ignore</td></tr>
<tr><td>Total</td><td>5</td><td>Ignore</td></tr>
</table>
</td><td>MI</td></tr>
</table>

<table>
<tr><th>No</th><th>Item</th><th>Criteria</th><th>Rank</th><th>Remark</th></tr>
<tr><td>9</td><td>Parts Mounting</td><td>Parts mounting failure is not allowed
Wrong parts mounted is not allowed</td><td>MA</td><td></td></tr>
<tr><td>10</td><td>Stains
Foreign Substance
Scratches
Spots</td><td>(1) Round shape
<table>
<tr><th rowspan="2">Area
Dimension</th><th colspan="2">Acceptable Q'ty</th><th rowspan="2">Remark</th></tr>
<tr><th>A Area</th><th>B Area</th></tr>
<tr><td>Φ ≤ 0.10</td><td colspan="2">Ignore</td><td></td></tr>
<tr><td>0.10 < Φ ≤ 0.20</td><td>2</td><td>Ignore</td><td></td></tr>
<tr><td>0.20 < Φ ≤ 0.30</td><td>1</td><td>Ignore</td><td></td></tr>
<tr><td>0.30 < Φ</td><td>0</td><td>Ignore</td><td></td></tr>
</table>
(2) Line shape
<table>
<tr><th colspan="2">Dimension</th><th colspan="2">Acceptable Q'ty</th><th rowspan="2">Remark</th></tr>
<tr><th>Length</th><th>Width</th><th>A Area</th><th>B Area</th></tr>
<tr><td>-</td><td>≤ 0.025</td><td colspan="2">Ignore</td><td></td></tr>
<tr><td>≤ 2.5</td><td>≤ 0.05</td><td>3</td><td>Ignore</td><td></td></tr>
<tr><td>≤ 1.5</td><td>≤0.075</td><td>2</td><td>Ignore</td><td></td></tr>
<tr><td></td><td>0.075 <</td><td colspan="2">Follow round shape</td><td></td></tr>
</table>
(1) & (2) total defect q'ty can not exceed 5</td><td>MI</td><td></td></tr>
<tr><td>11</td><td>Color Variation</td><td>Refer to the limit sample consented by both parties for judgement</td><td>MI</td><td></td></tr>
<tr><td>12</td><td>Solder Ball</td><td>1)Acceptable if the size of void is less than Φ0.13mm
2)Acceptable if a solder ball is up to Φ0.2mm but on shield space</td><td>MA</td><td></td></tr>
<tr><td>13</td><td>Parts Alignment</td><td>1)Acceptable if it dose not exceed 50% of the lead width IC
 

X ≤ W/2 : Accept
X > W/2 : Reject
IC LEAD
2)Rejectable, provided that it does exceed 50% of the component termination width
 

W1 > W2 : Reject</td><td>MI</td><td></td></tr>
</table>

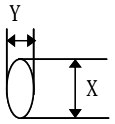
Note : A limitation sample is given top priority

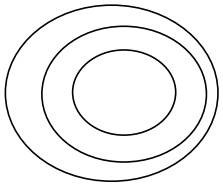
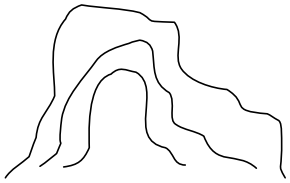
(4.0) Specification for Touch Panel Inspection

(4.1) Inspection Criterion and Level

Rank	Item	AQL	Note
Major (MA)	Function Failure	0.65	
Minor (MI)	Bubble, Scratch, Foreign Particle Newton Ring	1.0	

(4.2) Inspection Criterion

<table>
<tr><th>No</th><th>Item</th><th>Criteria</th><th>Rank</th><th>Note</th></tr>
<tr><td>1</td><td>Function</td><td>Fail to adjust, hard to adjust (can't be adjusted within 3 times): Reject
Stroke Drift, Stroke Suspension: Reject</td><td>MA</td><td rowspan="3"> 

** : 平均
直 径
(X + Y)/2</td></tr>
<tr><td>2</td><td>Air Bubble
Scratch
Foreign Particle</td><td>1) Round shape
<table>
<tr><th rowspan="2">Dimension</th><th colspan="2">Acceptable Q'ty</th><th rowspan="2">Remark</th></tr>
<tr><th>A area</th><th>B area</th></tr>
<tr><td>Φ ≤ 0.10</td><td colspan="2">Ignore</td><td></td></tr>
<tr><td>0.10 < Φ ≤ 0.20</td><td>2</td><td>Ignore</td><td></td></tr>
<tr><td>0.20 < Φ ≤ 0.30</td><td>1</td><td>Ignore</td><td></td></tr>
<tr><td>0.30 < Φ</td><td>0</td><td>Ignore</td><td></td></tr>
</table>
2) Line shape
<table>
<tr><th colspan="2">Dimension</th><th colspan="2">Acceptable Q'ty</th><th rowspan="2">Remark</th></tr>
<tr><th>length</th><th>Width</th><th>A area</th><th>B area</th></tr>
<tr><td>-</td><td>W≤0.025</td><td colspan="2">Ignore</td><td rowspan="5">Ignore</td></tr>
<tr><td>L≤3.0</td><td rowspan="2">W≤0.05</td><td colspan="2">Ignore</td></tr>
<tr><td>3.0<L≤5.0</td><td colspan="2">2</td></tr>
<tr><td>≤ 7</td><td>W≤0.1</td><td colspan="2">1</td></tr>
<tr><td>-</td><td>W>0.1</td><td colspan="2">Follow Round shape</td></tr>
</table></td><td>MI</td></tr>
<tr><td>3</td><td>Newton Ring</td><td>a）Regular
 
Ring area more than 1/3 of screen area: Reject
Ring area less than 1/3 of screen area: Accept
b）Irregular
 
Ring area more than 1/2 of screen area: Reject
Ring area less than 1/2 of screen area: Accept</td><td>MI</td></tr>
</table>

(5.0) Reliability Test

Item	Content
Room Temperature Operation	50,000 hrs

(5.1) Reliability Test - Module Middle Reliability

No.	Item	Condition	Duration	Sample Quantity	Creteria (Acc/Rej)	Note
1	High Temp Operation	70 ± 2℃	120 hrs	3	0/1	
2	High Temp Storage	80 ± 2℃	120 hrs	3	0/1	
3	Low Temp Operation	-20 ± 2℃	120 hrs	3	0/1	
4	Low Temp Storage	-30 ± 2℃	120 hrs	3	0/1	
5	High Temp and High Humidity Storage	60℃,90% RH	120 hrs	3	0/1	
6	High Temp and High Humidity Operation	60℃,90% RH	120 hrs	3	0/1	
7	Thermal Shock	-25℃(0.5h) ↔ 70℃(0.5h)	20cycle	3	0/1	
8	Packaging Vibration Test	To be measured after subjecting to total fixed amplitude of 1.5mm vibrating frequency 10 to 55Hz, one cycle 60 seconds to direction of X,Y,Z for each 15 minutes,(Total 45minutes) and after removing vibration				
9	Packaging Drop Test	To be measured after dropping from 80cm high onto steel board of 15mm thick and from 6 face				
10	ESD	- Condition:150pf, 330Ω, ±8KV, 5 times Air Discharge (ESD which is made by above condition should be shot on LCD glass panel, not other's area(such as on IC and so on) - After testing, cosmetic and electrical defects should not happen. -Total current consumption should be below double of initial value. -In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.				

(5.2) Criteria

a. No. 1 ~ 9 : No changes for indication and appearance.
b. No. 1 ~ 3, 5 ~ 9 : Leave the all samples under room temperature 4 hours after reliability test ends.
c. No. 4 : Leave the all samples under room temperature 12 hours after reliability test ends.

(5.3) Reliability Test - Touch Panel Reliability

No.	项目	条件	时间/次数	样本数量	标准 (Acc/Rej)	备注
1	Pen Sliding	Polyacetal Pen, 150gf 60mm/s frequency	10^5 times	1	0/1	
2	Hitting	Polyacetal Pen, HRR60-80 150gf, 2 times/s frequency	10^6 times	1	0/1	

2. BHL&BMDT Customer Quality Service Process

In order to provide better service for Customer, BHL&BMDT shall apply the after-sales product quality service process as below:

1> According to the P/O from Customer, BHL&BMDT should deliver required product to the right place appointed by Customer.
2> Customer shall apply inspection to the incoming procuct.
3> Inspection standard should be provided by BHL&BMDT, and it will become effective after confirmed by Customer. Inspection and Defects determination should be carried out according to the standard agreed by both Parties.
4> In order to guarantee in-time communication of product quality situation and effective service, QA staff on Customer side should send Weekly Quality Report to the appointed CS staff in BHL&BMDT.
5> After BHL&BMDT get related information, both sides should arrange time and place to determin the non-performing products found by Customer.
6> BHL&BMDT should cooperate with Customer in case of special quality requirement.
7> After confirmed by both side, BHL&BMDT should be responsible for the defect part caused by our quality problem. BHL&BMDT take back the confirmed defect products and return normal goods to customer.
8> BHL&BMDT agree to provide related training of LCD product technology and usage.
9> Customer should use the LCD product according to the instruction. BHL&BMDT will not be responsible for the defect product caused by violation of Users' Instruction.
10> Both parties should deal with the quality problem under the principle of mutual consultation and cooperation.And both parties should negotiate to handle the defect products of which the cause isn't clear.

3.LCD Module Operation Instruction

3.1 Cautions for storage

1> Avoid hitting the LCD Panel in any way because the LCD is made of glass.
2> Physical status of liquid crystal will change under extrem temperature, and it can not be resumed when the temperature returns to normal. So LCD module should be stored in required temperature. Same reason, LCD module should be stored in required humidity. Low hymidity may add static, while high humidity may corrode the ITO circuit of LCD product. The suitable storage environment is: temperature: 22±5 ℃, humidity: 55%±10%.
3> Avoid exposing LCD module under sunshine, strong fluorescence or ultraviolet radiation for a long time. It should be stored in dark area.
4> Chemical liquid is forbidden to clean the LCD, such as alcohol, acetone and IPA. Because all of these can do damage to the LCD. Water on the LCD surface must be cleaned as soon as possible, or it will cause POL color change or other defect.
5> LCD products should be stored in static-protective polythene bag under certain requirement.

3.2 Cautions for installing and assembling

1> Please make sure that operators wear static-protective bands correctly and working tables are effectively grounded during operation.
2> Please place LCD module on the tray provided by BHL&BMDT while moving it, in order to avoid mechanical damage. Hold the module's side frames to avoide damage during moving.
Please move and assemble LCD very carefully during assembly, and avoid pushing or twisting it.
3> Avoid disassembling LCD module or damage the FPC or permanent defect may happen.
4> Avoid cleaning the LCD surface with hard materials. Please clean LCD with Air-gun or very soft cloth when necessary. The protective film on the POL is prohibited to be removed until assembly, otherwise,dust,spit or other foreign matter may fall on the LCD surface. After the protective film is removed, only air-gun can be applied to remove any dust or foreign matter. Fingure or cloth MUST NOT be used in such cases.
5> Avoid twisting, disassembling, squeezing or hitting the PCB. It will damage the circuit or component on PCB and cause functional defect.
6> Please use the connector according to the instruction provided by BHL&BMDT.
7> Please place dual module with the sub-panel upward. Trays should be placed in contrary direction. An empty tray should be placed on the top.
8> Sealing operation on PCB must be very careful to avoid short or cutting the original circuit on PCB. Otherwise, permenant damage to the LCD may happen.
9> Please take great care to use connector. Defect caused by wrong or careless operation on Customer side are not within the compensation range.

3.3 Cautions for operation

1> Avoid adding direct DC or high voltage to LCD panel. It will cause functional damage to the LCD or shorten the life of LCD product.
2> LCD may respond slowly or display abnormally in extrem temperature (lower than -20 ℃ or higher than 50℃). But this doesn't mean LCD functional defect. LCD will display normally in regular temperature. Therefore, avoid using LCD product in extrem temperature.
3> Avoid pushing the display area of LCD panel which may cause abnormal display. This doesn't mean LCD functional defect, neither. LCD will display normally in regular temperature.
4> The black tape on IC on LCD product is used to protect the IC from light. Please do NOT remove it.
5> Electrical inspection for LCD product is carried out by using mobile phone provided by Customer. Special test equipment could be applied under mutual consent.