



# Winstar Display Co., LTD

## 華凌光電股份有限公司



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### SPECIFICATION

**CUSTOMER :** \_\_\_\_\_

**MODULE NO.:** WF43BTIBED0#000

<p><b>APPROVED BY:</b> ( FOR CUSTOMER USE ONLY )</p>	<p><b>PCB VERSION:</b> _____ <b>DATA:</b> _____</p>
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2009/9/9		First issue



**RECORDS OF REVISION**

**DOC. FIRST ISSUE**

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# 1. Module Classification Information

W F   43   B   T   I   B   E D 0 #000

① ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨⑩   ⑪

- ① Brand : WINSTAR DISPLAY CORPORATION
- ② Display Type : H→Character Type, G→Graphic Type F→TFT Type
- ③ Display Size : 4.3” TFT
- ④ Model serials no.
- ⑤ Backlight Type :      F→CCFL, White                                  T→LED, White
  
- ⑥ LCD Polarize                      A→Reflective, N.T, 6:00                      H→Transflective, W.T,6:00  
 Type/ Temperature              D→Reflective, N.T, 12:00                      K→Transflective, W.T,12:00  
 range/ View                          G→Reflective, W. T, 6:00                      C→Transmissive, N.T,6:00  
 direction                              J→Reflective, W. T, 12:00                      F→Transmissive, N.T,12:00  
     B→Transflective, N.T,6:00                      I→Transmissive, W. T, 6:00  
     E→Transflective, N.T.12:00                      L→Transmissive, W.T,12:00
- ⑦ A: TFT LCD  
 B: TFT+FR+CONTROL BOARD  
 C: TFT+FR+A/D BOARD  
 D:TFT+FR+A/D BOARD+CONTROL BOARD
- ⑧ Solution: A: 128160      B:320234      C:320240      D:480234      E : 480272
- ⑨ D: Digital      A: Analog
- ⑩ Version
- ⑪ Special Code                      #:Fit in with ROHS directive regulations  
     00: Sales code      0: Version (Add TS)

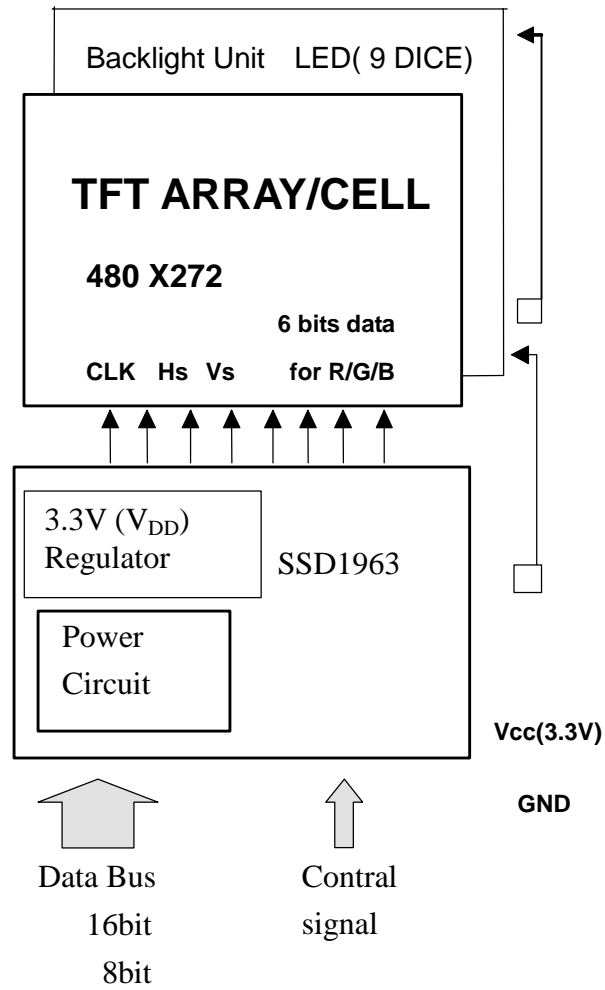
This product is composed of a TFT LCD panel, driver ICs, FPC, Control Board and a backlight unit. The following table described the features of WF43BTIBED0#000

Item	Dimension	Unit
Dot Matrix	480 x RGBx 272(TFT)	dots
Module dimension	105.5x 67.2 x 6.2 (max)	mm
View area	95.04x 53.856	mm
Dot pitch	0.198 x 0.198	mm
Driving IC package	COG	
LCD type	TFT, Negative, Transmissive	
View direction	6 o'clock	
Backlight Type	LED, Normally White	
Controller IC	SSD1963	

\*Expose the IC number blaze (Luminosity over than 1 cd) when using the LCM may cause IC operating failure.

\*Color tone slight changed by temperature and driving voltage.

## 2. Block Diagram



### 3. Electrical Characteristics

Item	Symbol	Values			Unit	Remark
		Min	TYP	max		
Operating voltage	VDD	3.0	3.3	3.6	V	
Input high voltage	VIH	0.8*VDD	-	VDD	V	
Input low voltage	VIL	0	-	0.2*VDD	V	
Output high voltage	VOH	VDD-0.3		VDD	V	
Output low voltage	VOL	0	-	0.3	V	
Current Consumption	IVCI	-	285	-	mA	
Power Consumption	PLCD	-	940.5	-	mW	

### 4. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T <sub>OP</sub>	-20	—	+70	°C
Storage Temperature	T <sub>ST</sub>	-30	—	+80	°C
Power Supply Voltage	VGH-VGL	-0.3		+45	V <sub>SS</sub> =0
	VCC	-0.3	—	6.0	V

## 5. Interface Pin Function

### 5-1 Pins Connection To Control Board

P/N	Symbol	8 B IT Function
1	GND	Ground
2	VCC	Power supply for Logic
3	B/L Enable	Backlight control
4	RS	Command/Data select
5	WR	8080 family MPU interface : Write signal
6	RD	8080 family MPU interface: Read signal
7	DB0	Data bus
8	DB1	
9	DB2	
10	DB3	
11	DB4	
12	DB5	
13	DB6	
14	DB7	
15	CS	Chip select
16	RES	REST
17	NC	No connection
18	X1	Touch screen
19	DISP ON	Display on
20	Y1	Touch screen
21	X2	Touch screen
22	Y2	Touch screen



## 6. DC CHARACTERISTICS

### Conditions:

Voltage referenced to VSS

VDDD, VDDPLL = 1.2V

VDDIO, VDDLCD = 3.3V

TA = 25°C

### DC Characteristics

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
PSTY	Quiescent Power			300		uW
IIZ	Input leakage current		-1		1	uA
IOZ	Output leakage current		-1		1	uA
VOH	Output high voltage		0.8VDDIO			V
VOL	Output low voltage				0.2VDDIO	V
VIH	Input high voltage		0.8VDDIO		VDDIO + 0.5	V
VIL	Input low voltage				0.2VDDIO	V

# 7. AC Characteristics

**Conditions:**

Voltage referenced to V<sub>SS</sub>

V<sub>DD</sub>, V<sub>DDPLL</sub> = 1.2V

V<sub>DDIO</sub>, V<sub>DDLCD</sub> = 3.3V

T<sub>A</sub> = 25°C

C<sub>L</sub> = 50pF (Bus/CPU Interface)

C<sub>L</sub> = 0pF (LCD Panel Interface)

## 7.1 Clock Timing

### Clock Input Requirements for CLK (PLL-bypass)

Symbol	Parameter	Min	Max	Units
FCLK	Input Clock Frequency (CLK)		120	MHz
TCLK	Input Clock period (CLK)	1/fCLK		ns

### Clock Input Requirements for CLK (Using PLL)

Symbol	Parameter	Min	Max	Units
FCLK	Input Clock Frequency (CLK)	2.5	50	MHz
TCLK	Input Clock period (CLK)	1/fCLK		ns

### Clock Input Requirements for crystal oscillator XTAL (Using PLL)

Symbol	Parameter	Min	Max	Units
FXTAL	Input Clock Frequency	2.5	10	MHz
TXTAL	Input Clock period	1/fXTAL		ns

## 7.2 MCU Interface Timing

### 7.2.1 6800 Mode

**Table 7-4: 6800 Mode Timing**

Symbol	Parameter	Min	Typ	Max	Unit
tcyc	Reference Clock Cycle Time	9	-	-	ns
tPWCSL	Pulse width CS# or E low	1	-	-	tCYC
tPWCSH	Pulse width CS# or E high	1	-	-	tCYC
tFDRD	First Data Read Delay	5	-	-	tCYC
tAS	Address Setup Time	1	-	-	ns
tAH	Address Hold Time	1	-	-	ns
tDSW	Data Setup Time	4	-	-	ns
tDHW	Data Hold Time	1	-	-	ns
tDSR	Data Access Time	-	-	5	ns
tDHR	Output Hold time	1	-	-	ns

Figure 7-1: 6800 Mode Timing Diagram (Use CS# as Clock)

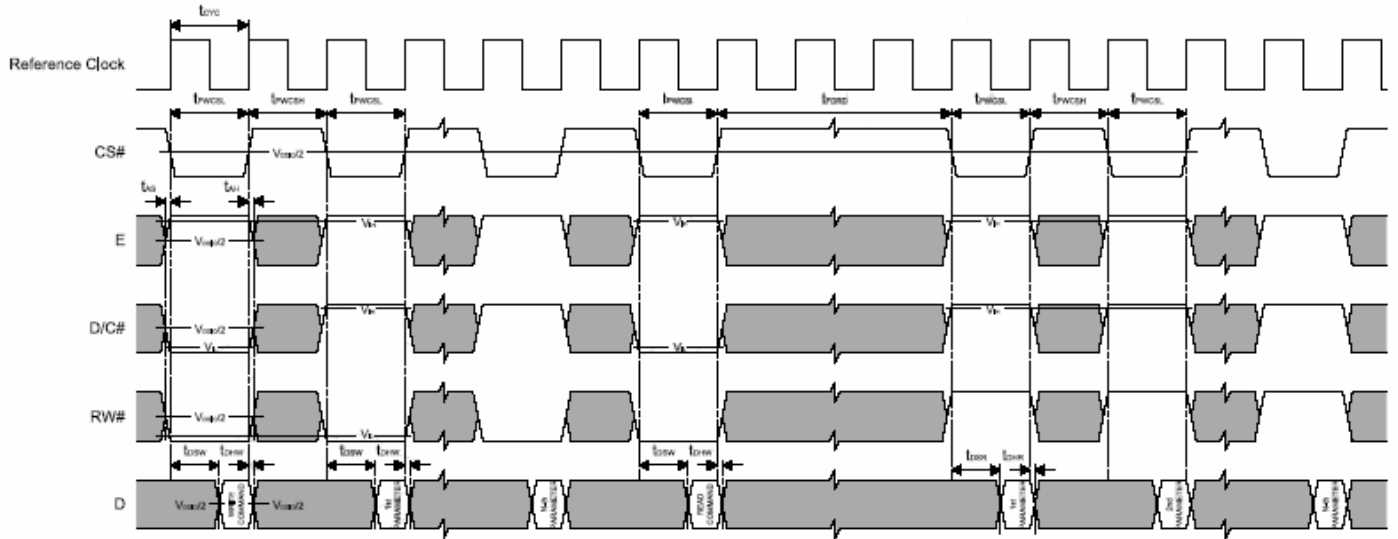
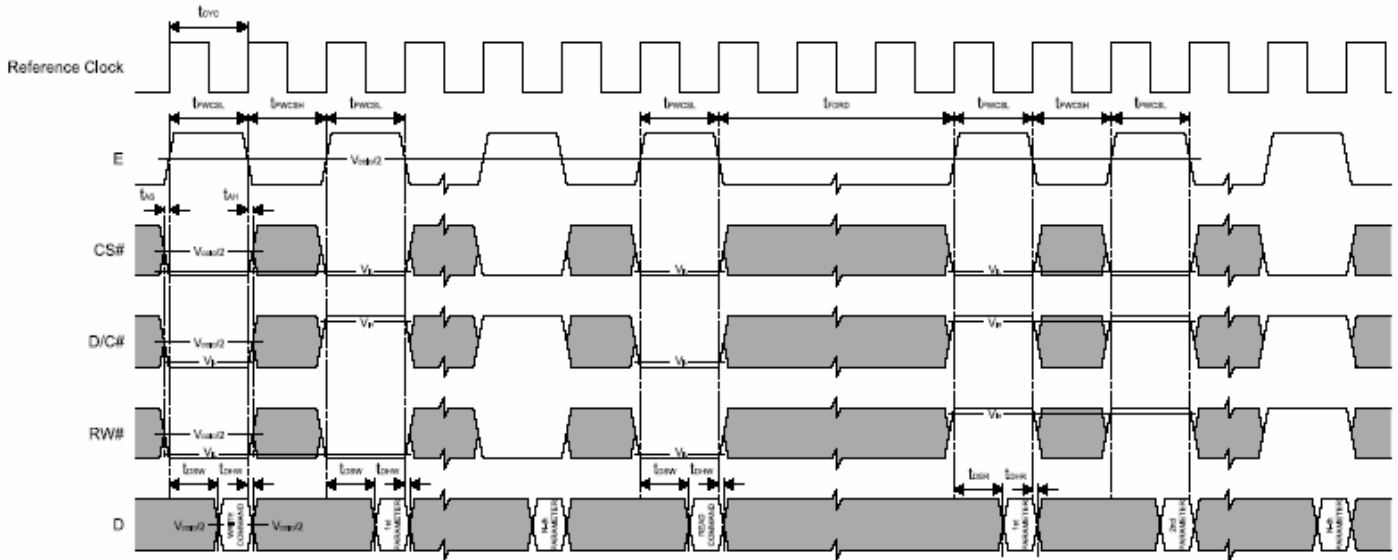


Figure 7-2: 6800 Mode Timing Diagram (Use E as Clock)

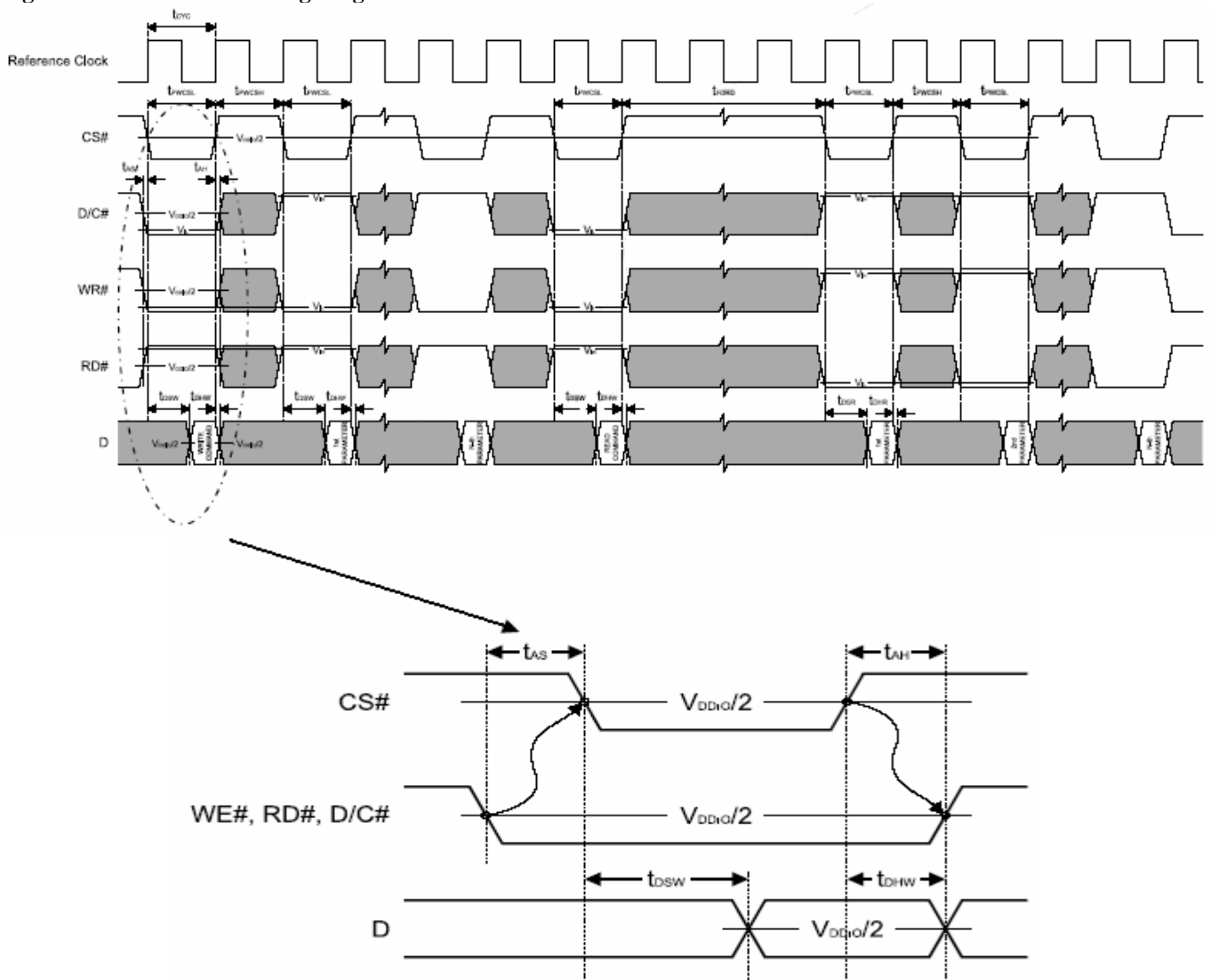


## 7.2.2 8080 Mode Write Cycle

Table 7-5: 8080 Mode Timing

Symbol	Parameter	Min	Typ	Max	Unit
t <sub>cy</sub>	Reference Clock Cycle Time	9	-	-	ns
t <sub>PWCSL</sub>	Pulse width CS# low	1	-	-	t <sub>CYC</sub>
t <sub>PWCSH</sub>	Pulse width CS# high	1	-	-	t <sub>CYC</sub>
t <sub>FDRD</sub>	First Read Data Delay	5	-	-	t <sub>CYC</sub>
t <sub>AS</sub>	Address Setup Time	1	-	-	ns
t <sub>AH</sub>	Address Hold Time	1	-	-	ns
t <sub>DSW</sub>	Data Setup Time	4	-	-	ns
t <sub>DHW</sub>	Data Hold Time	1	-	-	ns
t <sub>DSR</sub>	Data Access Time	-	-	5	ns
t <sub>DHR</sub>	Output Hold time	1	-	-	ns

Figure 7-3: 8080 Mode Timing Diagram



# 8. Data transfer order Setting

## Pixel Data Format

Both 6800 and 8080 support 8-bit, 9-bit, 16-bit, 18-bit and 24-bit data bus. Depending on the width of the data bus, the display data are packed into the data bus in different ways.

Pixel Data Format :

Interface	Cycle	D[23]	D[22]	D[21]	D[20]	D[19]	D[18]	D[17]	D[16]	D[15]	D[14]	D[13]	D[12]	D[11]	D[10]	D[9]	D[8]	D[7]	D[6]	D[5]	D[4]	D[3]	D[2]	D[1]	D[0]	
24 bits	1 <sup>st</sup>	R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0	
18 bits	1 <sup>st</sup>							R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0	
16 bits (565 format)	1 <sup>st</sup>									R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1
16 bits	1 <sup>st</sup>									R5	R4	R3	R2	R1	R0	X	X	G5	G4	G3	G2	G1	G0	X	X	
	2 <sup>nd</sup>									B5	B4	B3	B2	B1	B0	X	X	R5	R4	R3	R2	R1	R0	X	X	
	3 <sup>rd</sup>									G5	G4	G3	G2	G1	G0	X	X	B5	B4	B3	B2	B1	B0	X	X	
9 bits	1 <sup>st</sup>																	R5	R4	R3	R2	R1	R0	G5	G4	G3
	2 <sup>nd</sup>																	G2	G1	G0	B5	B4	B3	B2	B1	B0
8 bits	1 <sup>st</sup>																	R5	R4	R3	R2	R1	R0	X	X	
	2 <sup>nd</sup>																	G5	G4	G3	G2	G1	G0	X	X	
	3 <sup>rd</sup>																	B5	B4	B3	B2	B1	B0	X	X	

X: Don't Care

## 9 Register Depiction

Please consult the spec of SSD1963

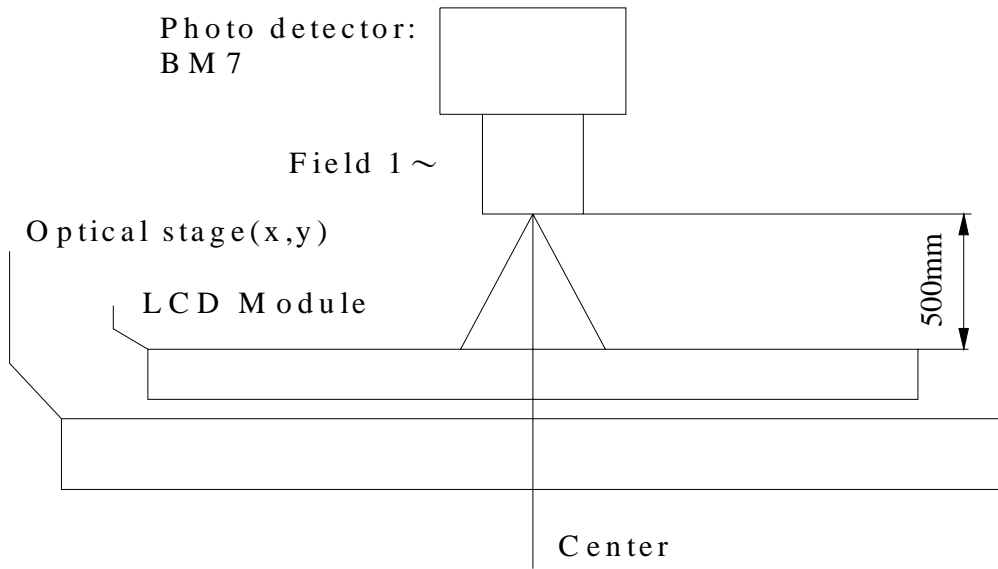
# 10. OPTICAL CHARACTERISTIC

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent with the methods shown in Note.1.

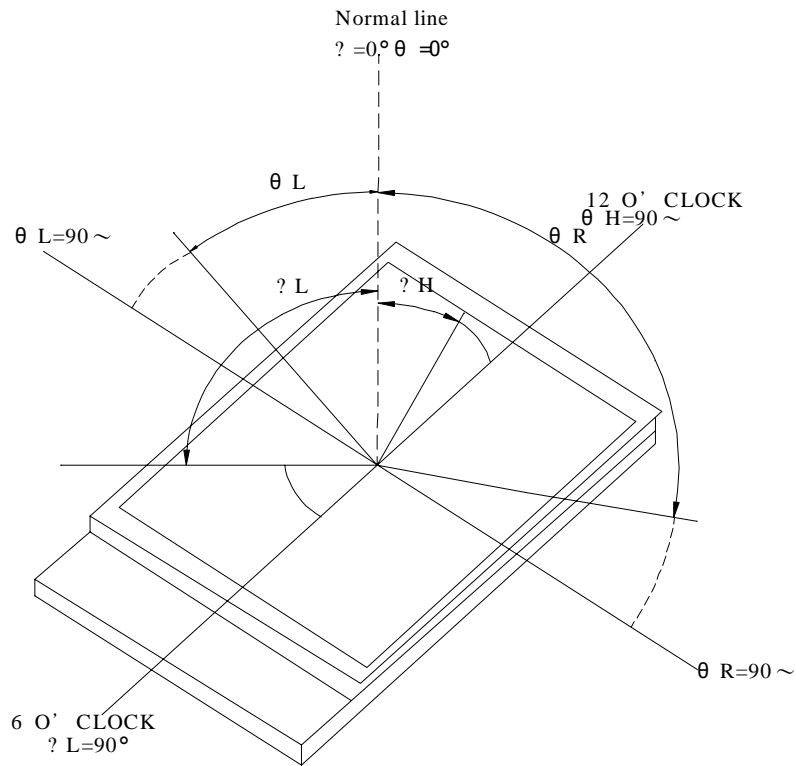
## 7.1 Main LCD Optical Characteristics

Item		Symbol	Condition	Min	TYP	max	Unit	Remark
Viewing Angle	Top	FH	CR ≥ 10	-	50	-	degree	Note.2
	Bottom	FL		-	55	-		
	Left	TL		-	60	-		
	Right	TR		-	60	-		
Response time (Tr+Tf)			T=0		50	-	ms	Note.3
Brightness			Center	350	400		Cm/m <sup>2</sup>	
Contrast Ratio		CR	At optimized Viewing angle	200	250	-	-	Note.4
Color chromaticity	White	Xw	Viewing normal angle F,T=0	0.258	0.308	0.358	-	Note.5
		Yw		0.278	0.328	0.378		
	Red	XR		0.558	0.608	0.658	-	
		YR		0.307	0.357	0.407		
	Green	XG		0.279	0.329	0.379	-	-
		YG		0.533	0.583	0.633		
	Blue	XB		0.093	0.143	0.193	-	-
		YB		0.050	0.100	0.150		

Note.1: 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 50 cm and normal direction.



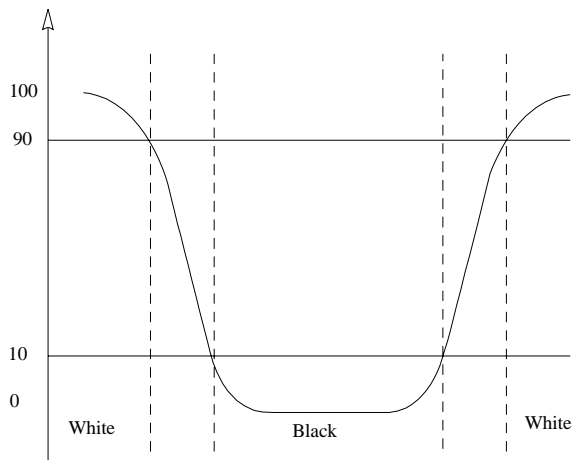
Not.2:Definition of Viewing Angle: Refer to figure as below:



Not.3:Definition of Response Time: TR and TF

The figure below is the output signal of the photo detector.





Not4:Definition of Contrast Ratio(CR)

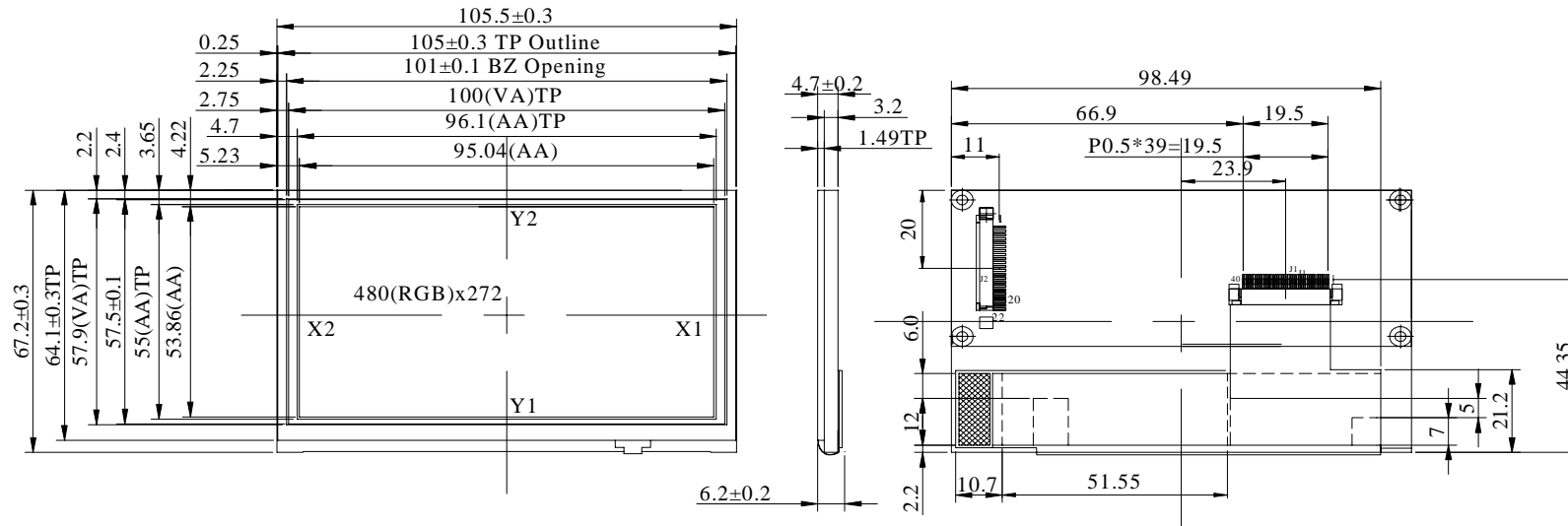
Ratio of gray max (G max)&gray min(G min)

(G max)=luminance with all pixel white

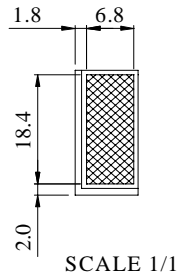
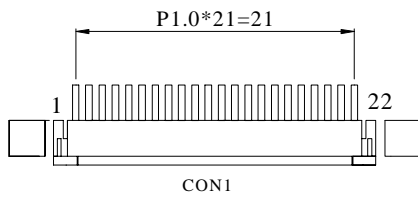
(G min)= luminance with all pixel black

Not5:Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

# 11. Contour Drawing



PIN	ASSIGNMENT
1	GND
2	VDD
3	B/L Enable
4	RS
5	WR
6	RD
7	DB0
8	DB1
9	DB2
10	DB3
11	DB4
12	DB5
13	DB6
14	DB7
15	CS
16	RES
17	NC
18	X1
19	DISP_ON
20	Y1
21	X2
22	Y2



The non-specified tolerance of dimension is  $\pm 0.2$ mm.

# 12.Touch Screen Panel Specifications

## 12.1Electronic characteristics

Item		Min	TYP	max	Unit	Note
Linearity		-	-	1.5	%	
Circuit Resistance	X-axis	450	800	1150	$\Omega$	
	Y-axis	100	350	600	$\Omega$	
Insulation Resistance		20	-	-	M $\Omega$	
Operating Voltage		-	-	5	V	
Chattering		-	-	10	ms	
Transmittance		82	-	-	%	

## 12.2Mechanical & Reliability Characteristics

Item	Min	TYP	max	Unit	Note
Activation force			60	g	Note.1
Pen Writing Durability	100,000			Characters	Note.2
Pitting Durability	1,000,000			Touches	Note.3
Surface hardness	3			H	
Haze		7		%	With AR coating

Note.1:Operation force with R8.0mm silicone finger.

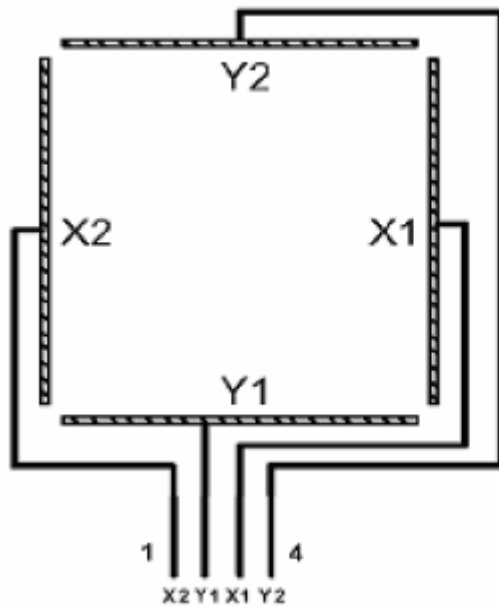
Note.2:Writing with r0.8mm plastic stylus pen;writing force 150g in active area.

(Each direction inside Active area 3mm)

Speed is 60mm/sec.

Note.3:With the silicon Rubber R8mm on the same point of the touch panel with 250g force , frequency 240 times/min.

### 12.3 Touch Screen Panel

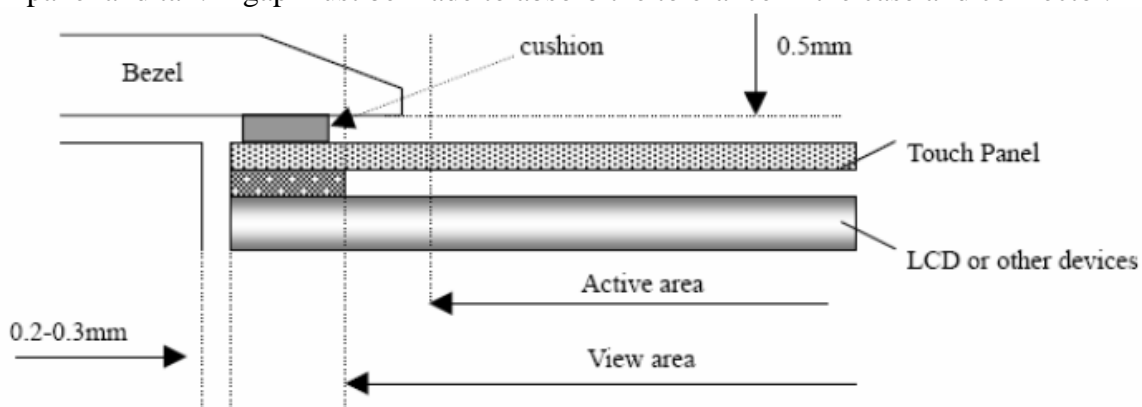


### 12.4 Touch Screen Panel pin define

Pin NO.	symbol	I/O	Function
1	X2	Left	Left electrode-differential analog
2	Y1	Bottom	Bottom electrode-differential analog
3	X1	Right	Right electrode-differential analog
4	Y2	Top	Top electrode-differential analog

### 12.5 Design Guideline For Touch Panel.

Bezel edge must be positioned in the area between the active area and view area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2~0.3mm for the outside dimension of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.



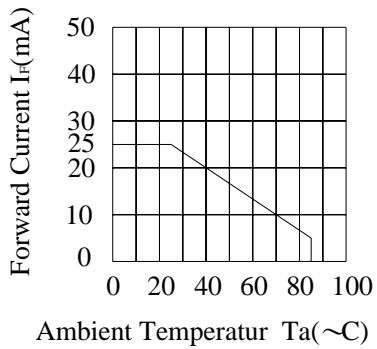
# 13. LED driving conditions

## Backlight Unit(VSS=0v)

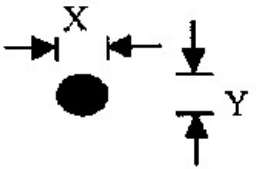
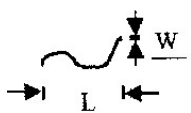
Item	Symbol	Values			Unit	Remark
		Min	TYP	max		
LED Voltage	VL	-	25	-	V	
LED Current	IF	-	20	-	MA	
Power Consumption	PLED	-	500	-	MW	

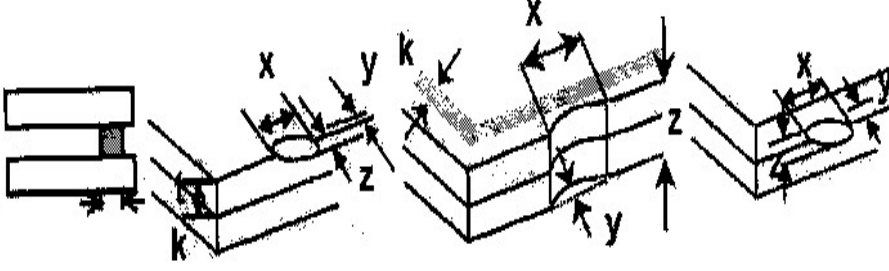
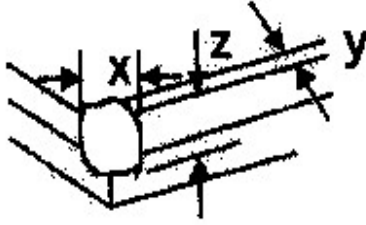
## LED Forward Current

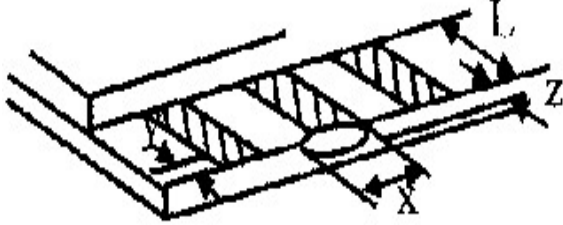
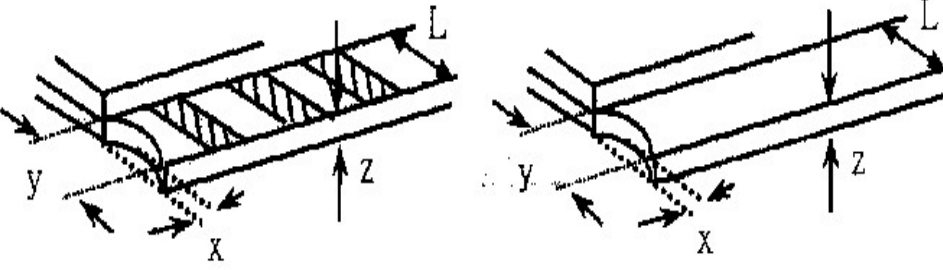
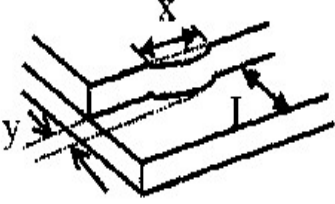
Forward Current Derating Curve



# 14. Inspection specification

NO	Item	Criterion	AQL													
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Contrast defect.	0.65													
02	Black or white spots on LCD (display only)	2.1 White and black spots on display $\leq 0.25\text{mm}$ , no more than three white or black spots present. 2.2 Densely spaced: No more than two spots or lines within 3mm	2.5													
03	LCD black spots, white spots, contamination (non-display)	3.1 Round type : As following drawing $\Phi = (x + y) / 2$  <table border="1" data-bbox="874 884 1353 1097"> <thead> <tr> <th>SIZE</th> <th>Acceptable Q TY</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.10</math></td> <td>Accept no dense</td> </tr> <tr> <td><math>0.10 &lt; \Phi \leq 0.20</math></td> <td>2</td> </tr> <tr> <td><math>0.20 &lt; \Phi \leq 0.25</math></td> <td>1</td> </tr> <tr> <td><math>0.25 &lt; \Phi</math></td> <td>0</td> </tr> </tbody> </table>	SIZE	Acceptable Q TY	$\Phi \leq 0.10$	Accept no dense	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	1	$0.25 < \Phi$	0	2.5			
		SIZE	Acceptable Q TY													
$\Phi \leq 0.10$	Accept no dense															
$0.10 < \Phi \leq 0.20$	2															
$0.20 < \Phi \leq 0.25$	1															
$0.25 < \Phi$	0															
3.2 Line type : (As following drawing)  <table border="1" data-bbox="710 1176 1353 1384"> <thead> <tr> <th>Length</th> <th>Width</th> <th>Acceptable Q TY</th> </tr> </thead> <tbody> <tr> <td>---</td> <td><math>W \leq 0.02</math></td> <td>Accept no dense</td> </tr> <tr> <td><math>L \leq 3.0</math></td> <td><math>0.02 &lt; W \leq 0.03</math></td> <td rowspan="2">2</td> </tr> <tr> <td><math>L \leq 2.5</math></td> <td><math>0.03 &lt; W \leq 0.05</math></td> </tr> <tr> <td>---</td> <td><math>0.05 &lt; W</math></td> <td>As round type</td> </tr> </tbody> </table>	Length	Width	Acceptable Q TY	---	$W \leq 0.02$	Accept no dense	$L \leq 3.0$	$0.02 < W \leq 0.03$	2	$L \leq 2.5$	$0.03 < W \leq 0.05$	---	$0.05 < W$	As round type	2.5	
Length	Width	Acceptable Q TY														
---	$W \leq 0.02$	Accept no dense														
$L \leq 3.0$	$0.02 < W \leq 0.03$	2														
$L \leq 2.5$	$0.03 < W \leq 0.05$															
---	$0.05 < W$	As round type														
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction.	<table border="1" data-bbox="842 1438 1353 1688"> <thead> <tr> <th>Size <math>\Phi</math></th> <th>Acceptable Q TY</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.20</math></td> <td>Accept no dense</td> </tr> <tr> <td><math>0.20 &lt; \Phi \leq 0.50</math></td> <td>3</td> </tr> <tr> <td><math>0.50 &lt; \Phi \leq 1.00</math></td> <td>2</td> </tr> <tr> <td><math>1.00 &lt; \Phi</math></td> <td>0</td> </tr> <tr> <td>Total Q TY</td> <td>3</td> </tr> </tbody> </table>	Size $\Phi$	Acceptable Q TY	$\Phi \leq 0.20$	Accept no dense	$0.20 < \Phi \leq 0.50$	3	$0.50 < \Phi \leq 1.00$	2	$1.00 < \Phi$	0	Total Q TY	3	2.5
Size $\Phi$	Acceptable Q TY															
$\Phi \leq 0.20$	Accept no dense															
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$0.50 < \Phi \leq 1.00$	2															
$1.00 < \Phi$	0															
Total Q TY	3															

NO	Item	Criterion	AQL																		
05	Scratches	Follow NO.3 LCD black spots, white spots, contamination																			
06	Chipped glass	<p>Symbols Define:  x: Chip length            y: Chip width            z: Chip thickness  k: Seal width            t: Glass thickness        a: LCD side length  L: Electrode pad length:</p> <p>6.1 General glass chip :  6.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="443 795 1353 922"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <tr> <td><math>Z \leq 1/2t</math></td> <td>Not over viewing area</td> <td><math>x \leq 1/8a</math></td> </tr> <tr> <td><math>1/2t &lt; z \leq 2t</math></td> <td>Not exceed 1/3k</td> <td><math>x \leq 1/8a</math></td> </tr> </tbody> </table> <p>⊙If there are 2 or more chips, x is total length of each chip.</p> <p>6.1.2 Corner crack:</p>  <table border="1" data-bbox="443 1317 1353 1444"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <tr> <td><math>Z \leq 1/2t</math></td> <td>Not over viewing area</td> <td><math>x \leq 1/8a</math></td> </tr> <tr> <td><math>1/2t &lt; z \leq 2t</math></td> <td>Not exceed 1/3k</td> <td><math>x \leq 1/8a</math></td> </tr> </tbody> </table> <p>⊙If there are 2 or more chips, x is the total length of each chip.</p>	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length																			
$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$																			
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NO	Item	Criterion	AQL							
06	Glass crack	<p>Symbols :</p> <p>x: Chip length      y: Chip width      z: Chip thickness  k: Seal width      t: Glass thickness      a: LCD side length  L: Electrode pad length</p> <p>6.2 Protrusion over terminal :</p> <p>6.2.1 Chip on electrode pad :</p> 	2.5							
		<table border="1"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td><math>y \leq 0.5\text{mm}</math></td> <td><math>x \leq 1/8a</math></td> <td><math>0 &lt; z \leq t</math></td> </tr> </table>		y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$	
		y: Chip width		x: Chip length	z: Chip thickness					
		$y \leq 0.5\text{mm}$		$x \leq 1/8a$	$0 < z \leq t$					
<p>6.2.2 Non-conductive portion:</p> 										
<table border="1"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td><math>y \leq L</math></td> <td><math>x \leq 1/8a</math></td> <td><math>0 &lt; z \leq t</math></td> </tr> </table> <p>⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.</p> <p>⊙ If the product will be heat sealed by the customer, the alignment mark not be damaged.</p> <p>6.2.3 Substrate protuberance and internal crack.</p>  <table border="1"> <tr> <td>y: width</td> <td>x: length</td> </tr> <tr> <td><math>y \leq 1/3L</math></td> <td><math>x \leq a</math></td> </tr> </table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$x \leq a$
y: Chip width	x: Chip length	z: Chip thickness								
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$								
y: width	x: length									
$y \leq 1/3L$	$x \leq a$									



NO	Item	Criterion	AQL
07	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
08	Backlight elements	8.1 Illumination source flickers when lit. 8.2 Spots or scratched that appear when lit must be judged. Using LCD spot, lines and contamination standards. 8.3 Backlight doesn't light or color wrong.	0.65 2.5 0.65
09	Bezel	9.1 Bezel may not have rust, be deformed or have fingerprints, stains or other contamination. 9.2 Bezel must comply with job specifications.	2.5 0.65
10	PCB、COB	10.1 COB seal may not have pinholes larger than 0.2mm or contamination. 10.2 COB seal surface may not have pinholes through to the IC. 10.3 The height of the COB should not exceed the height indicated in the assembly diagram. 10.4 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. 10.5 No oxidation or contamination PCB terminals. 10.6 Parts on PCB must be the same as on the production characteristic chart. There should be no wrong parts, missing parts or excess parts. 10.7 The jumper on the PCB should conform to the product characteristic chart. 10.8 If solder gets on bezel tab pads, LED pad, zebra pad or screw hold pad, make sure it is smoothed down.	2.5 2.5 0.65 2.5 2.5 0.65 0.65 2.5
11	Soldering	11.1 No un-melted solder paste may be present on the PCB. 11.2 No cold solder joints, missing solder connections, oxidation or icicle. 11.3 No residue or solder balls on PCB. 11.4 No short circuits in components on PCB.	2.5 2.5 2.5 0.65

NO	Item	Criterion	AQL
12	General appearance	12.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP.	2.5
		12.2 No cracks on interface pin (OLB) of TCP.	0.65
		12.3 No contamination, solder residue or solder balls on product.	2.5
		12.4 The IC on the TCP may not be damaged, circuits.	2.5
		12.5 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.	2.5
		12.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color.	2.5
		12.7 Sealant on top of the ITO circuit has not hardened.	0.65
		12.8 Pin type must match type in specification sheet.	0.65
		12.9 LCD pin loose or missing pins.	0.65
		12.10 Product packaging must the same as specified on packaging specification sheet.	0.65
		12.11 Product dimension and structure must conform to product specification sheet.	

**1、Panel Specification :**

1. Panel Type :  Pass  NG , \_\_\_\_\_
2. View Direction :  Pass  NG , \_\_\_\_\_
3. Numbers of Dots :  Pass  NG , \_\_\_\_\_
4. View Area :  Pass  NG , \_\_\_\_\_
5. Active Area :  Pass  NG , \_\_\_\_\_
6. Operating Temperature :  Pass  NG , \_\_\_\_\_
7. Storage Temperature :  Pass  NG , \_\_\_\_\_
8. Others : \_\_\_\_\_

**2、Mechanical Specification :**

1. PCB Size :  Pass  NG , \_\_\_\_\_
2. Frame Size :  Pass  NG , \_\_\_\_\_
3. Material of Frame :  Pass  NG , \_\_\_\_\_
4. Connector Position :  Pass  NG , \_\_\_\_\_
5. Fix Hole Position :  Pass  NG , \_\_\_\_\_
6. Backlight Position :  Pass  NG , \_\_\_\_\_
7. Thickness of PCB :  Pass  NG , \_\_\_\_\_
8. Height of Frame to PCB :  Pass  NG , \_\_\_\_\_
9. Height of Module :  Pass  NG , \_\_\_\_\_
10. Others :  Pass  NG , \_\_\_\_\_

**3、Relative Hole Size :**

1. Pitch of Connector :  Pass  NG , \_\_\_\_\_
2. Hole size of Connector :  Pass  NG , \_\_\_\_\_
3. Mounting Hole size :  Pass  NG , \_\_\_\_\_
4. Mounting Hole Type :  Pass  NG , \_\_\_\_\_
5. Others :  Pass  NG , \_\_\_\_\_

**4、Backlight Specification :**

1. B/L Type :  Pass  NG , \_\_\_\_\_
2. B/L Color :  Pass  NG , \_\_\_\_\_
3. B/L Driving Voltage (Reference for LED Type) :  Pass  NG , \_\_\_\_\_
4. B/L Driving Current :  Pass  NG , \_\_\_\_\_
5. Brightness of B/L :  Pass  NG , \_\_\_\_\_
6. B/L Solder Method :  Pass  NG , \_\_\_\_\_
7. Others :  Pass  NG , \_\_\_\_\_

>> **Go to page 2** <<



**5、Electronic Characteristics of Module :**

- 1. Input Voltage :  Pass  NG , \_\_\_\_\_
- 2. Supply Current :  Pass  NG , \_\_\_\_\_
- 3. Driving Voltage for LCD :  Pass  NG , \_\_\_\_\_
- 4. Contrast for LCD :  Pass  NG , \_\_\_\_\_
- 5. B/L Driving Method :  Pass  NG , \_\_\_\_\_
- 6. Negative Voltage Output :  Pass  NG , \_\_\_\_\_
- 7. Interface Function :  Pass  NG , \_\_\_\_\_
- 8. LCD Uniformity :  Pass  NG , \_\_\_\_\_
- 9. ESD test :  Pass  NG , \_\_\_\_\_
- 10. Others :  Pass  NG , \_\_\_\_\_

**6、Summary :**

Sales signature : \_\_\_\_\_

Customer Signature : \_\_\_\_\_

Date : \_\_\_\_ / \_\_\_\_ / \_\_\_\_