 东莞市方胜电子有限公司 FANGSHENG ELECTRONICS(DONGGUAN) CO.,LTD.	Add:	In Building 2 ,BaiDai Industrial Park,ChangPing Road, DaoJiao Town, DongGuan City GuangDong Province, China.		
	Tel:	+86-769-22705821	Fax:	+86-769 2270 5825

SPECIFICATION

COG-TA10MB1XH-02

Preliminary Specification

Final Specification

**FANGSHENG ELECTRONIC
CO., LTD.**

CUSTOMER:

Made By:
Checked By:
Approved By:
Quality:
Date:
Note:

Approved By:
Date:
Note:

Contents

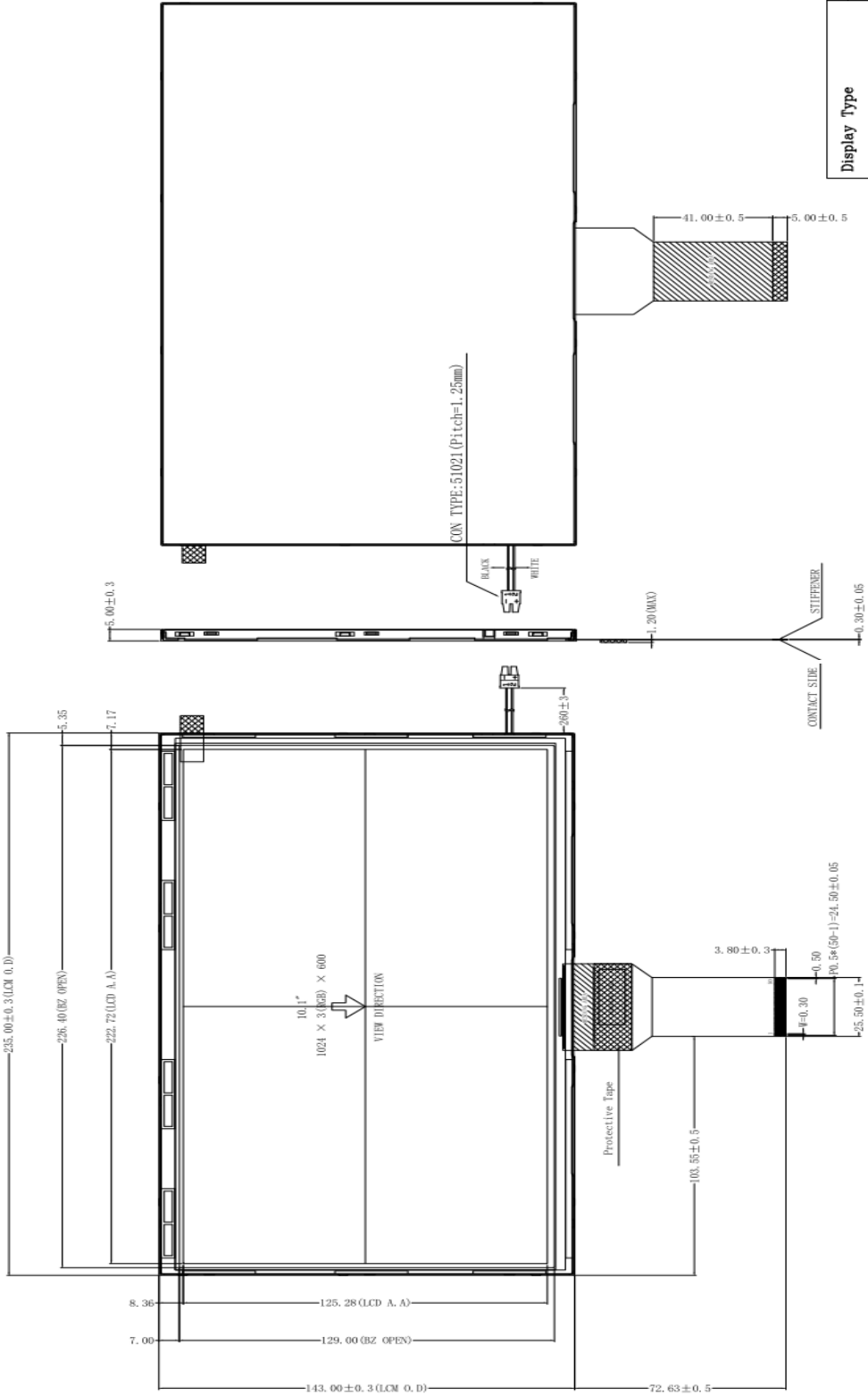
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1. General Specification

Item	Contents	Unit
LCD type	TFT/Transmissive	
Module size (W*H*T)	235.00*143.00*5.00	mm
Active size (W*H)	222.72*125.28	mm
Pixel pitch (W*H)	0.2175*0.2088	mm
Number of dots	1024*600	
Driver IC	HX8282-A01+HX8696-A01	
Interface type	RGB Interface	
Top polarizer type	Anti-Glare	
Recommend viewing direction	12	O'clock
Gary scale inversion direction	6	O'clock
Backlight type	24-Chip white LED	
Touch panel type	Without	

2. Mechanical Drawing

PIN DESCRIPTION	
Pin Symbol	
1	NC
2	NC
3	NC
4	NC
5	GND
6	VCOM
7	DVDD
8	MODE
9	DN
10	VS
11	HS
12	BP
13	B6
14	B5
15	B4
16	B3
17	B2
18	B1
19	B0
20	G7
21	G6
22	G5
23	G4
24	G3
25	G2
26	G1
27	G0
28	R7
29	R6
30	R5
31	R4
32	R3
33	R2
34	R1
35	R0
36	GND
37	CLK
38	GND
39	L/R
40	U/D
41	VGH
42	VGL
43	AVDD
44	RESST
45	NC
46	VCOM
47	DITHB
48	GND
49	NC
50	NC



Display Type	TFT, TRANSMISSIVE
Optimum Viewing Direction	NORMALLY WHITE
LCD Driver IC	HX8282-A01+HX8696-A01
Logic Voltage	VDD=3.3V
Operation Temperature	-20°C TO 70°C
Storage Temperature	-30°C TO 80°C
Interface	RGB interface
Backlight	24-LED WHITE
Surface luminance	350cd/m2(TYP.)
White X/Y	

DRAWING NO.	
COG-TA10MB1XH-02	
UNIT	mm
SCALE	1:1
3rd Angle	
SHEET 1 OF 1	

TITLE	
MODULE SPEC.	

DRAWN	ShengNan
ME.CHECKED	
EE.CHECKED	
APPROVED	
CUSTOMER'S APPROVAL	

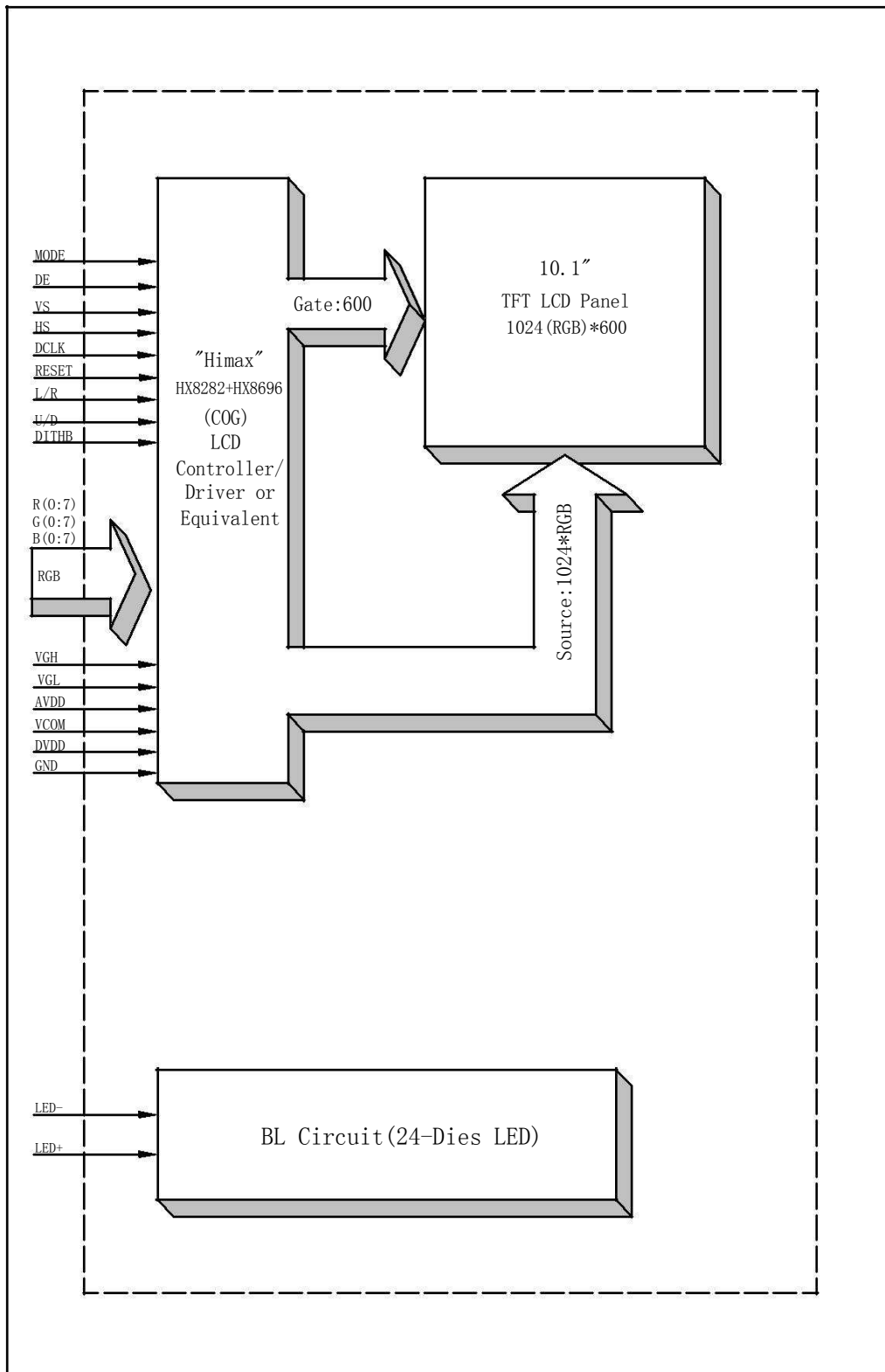
2019.2.20A	DATE
	SIGN

First issue	AMENDMENT
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V00.	VER. SYMBOL
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- NOTES:
 1. GENERAL TOLERANCE: ±0.2
 2. () REFERENCE DIMENSION
 3. REQUIREMENTS ON ENVIRONMENTAL PROTECTION: ROHS

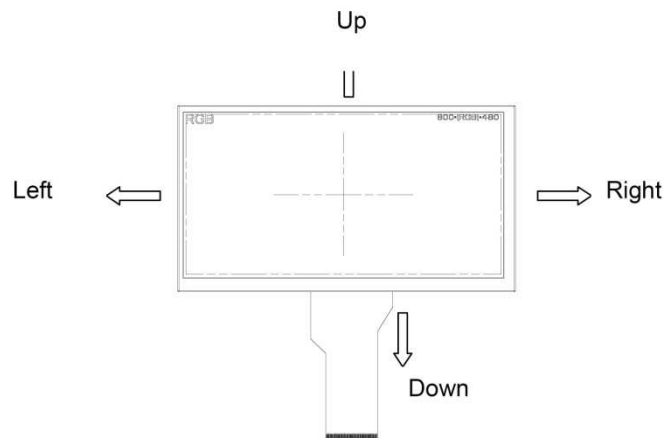
3. Block Diagram



4. Interface Pin Function

Pin No.	Symbol	Description
1	NC	No connection
2	NC	No connection
3	NC	No connection
4	NC	No connection
5	GND	Power ground
6	VCOM	Common Voltage
7	DVDD	Power for digital circuit
8	MODE	DE / SYNC mode select. Normally pull high. When MODE=H, DE mode. When MODE=L, SYNC mode.
9	DE	Data input enable for TTL mode. Active high to enable the data input. Normally pull low.
10	VS	In TTL mode, for Vertical Sync input. Negative polarity.
11	HS	In TTL mode, for Horizontal Sync input. Negative polarity.
12	B7	Blue bus data
13	B6	Blue bus data
14	B5	Blue bus data
15	B4	Blue bus data
16	B3	Blue bus data
17	B2	Blue bus data
18	B1	Blue bus data
19	B0	Blue bus data
20	G7	Green bus data
21	G6	Green bus data
22	G5	Green bus data
23	G4	Green bus data
24	G3	Green bus data
25	G2	Green bus data
26	G1	Green bus data
27	G0	Green bus data
28	R7	Red bus data
29	R6	Red bus data
30	R5	Red bus data
31	R4	Red bus data
32	R3	Red bus data
33	R2	Red bus data
34	R1	Red bus data

35	R0	Red bus data
36	GND	Power ground
37	DCLK	In TTL mode, DCLK for clock input.
38	GND	Power ground
39	L/R	Source Driver internal shift register is controlled by this pin as shown below: Normally pull high. (Note)
40	U/D	Gate Driver Up/down scan setting. Normally pull low. (Note)
41	VGH	Gate ON Voltage
42	VGL	Gate OFF Voltage
43	AVDD	Power for analog circuit
44	RESET	Global reset pin
45	NC	No connection
46	VCOM	Common Voltage
47	DITHB	Dithering function enable control. Normally pull low. When DITHER=H, Enable internal dithering function. When DITHER=L, Disable internal dithering function.
48	GND	Power ground
49	NC	No connection
50	NC	No connection



Note:

L/R:Source Driver internal shift register is controlled by this pin as shown below: Normally pull high.

L/R=H: SO1, SO2, SO3, . . . ,SO1536. (Default)

L/R=L: SO1536, SO1535, SO1534, . . . ,SO1.

U/D:Gate Driver Up/down scan setting. Normally pull low.

When U/D=H, reverse scan.

STV1 output vertical start pulse and UD pin output “H” to Gate driver When U/D=L, normal scan. (Default)

STV2 output vertical start pulse and UD pin output “L” to Gate driver.

5. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	DVDD	-0.3	5.0	V
Supply voltage for analog	AVDD	-0.5	15	V
Power supply	VGH	-0.3	42	V
Power supply	VGL	-20	0.3	V
Power supply	VGH- VGL	-0.3	40	V
Supply current (One LED)	I _{LED}		30	mA
Operating temperature	T _{OP}	-20	+70	°C
Storage temperature	T _{ST}	-30	+80	°C

Note: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

6. Electrical Characteristics

6.1 Input Power

Item	Symbol	Min	Typ.	Max	Unit	Applicable terminal
Supply Voltage for Logic	DVDD	3.0	3.3	3.6	V	
Supply Voltage for Analog	AVDD	9.4	9.6	9.8	V	
Power supply	VGH	20	21	22	V	
Power supply	VGL	-8.6	-8	-7.4	V	
Power supply	VCOM	3.1	3.3	3.5	V	
Input Voltage	V _{IL}	GND	-	0.3DVDD	V	
	V _{IH}	0.7 DVDD	-	DVDD		
Input leakage Current	I _{LKG}	-		-	μA	

6.2 Backlight Driving Conditions

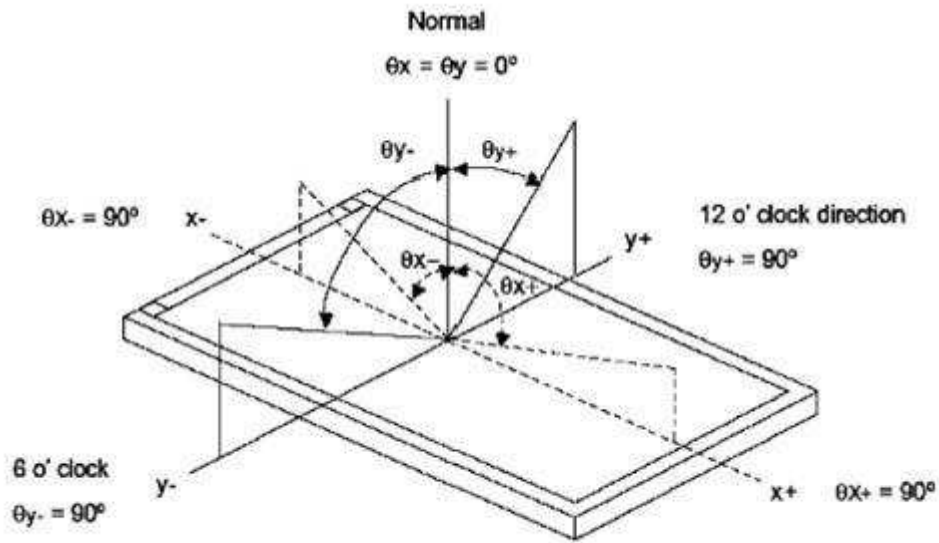
Item	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V _F	8.4	9.6	10.5	V	I _L =200mA
Current for LED Backlight	I _L		200		mA	
Power Consumption	P		1.92		W	
LED Life Time		30,000	50,000		Hr	Note

Note: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25°C

7. Optical Characteristics

ITEM	SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE	
			MIN	TYP.	MAX			
Luminance	L	IL =200mA	280	350	500	Cd/m ²		
Contrast Ratio	CR	$\theta=0^\circ$	500	600				
Response Time	T _{ON}	25°C		25	40	ms		
	T _{OFF}							
CIE Color Coordinate	Red	X _R						
		Y _R						
	Green	X _G						
		Y _G						
	Blue	X _B						
		Y _B						
	White	X _W	0.261	0.301	0.341			
		Y _W	0.299	0.339	0.379			
Viewing Angle	Hor.	θ_{x+}		80		Degree		
		θ_{x-}		80				
	Ver.	θ_{y+}		60				
		θ_{y-}		70				
			CR≥10					
	Uniformity	Un		80				

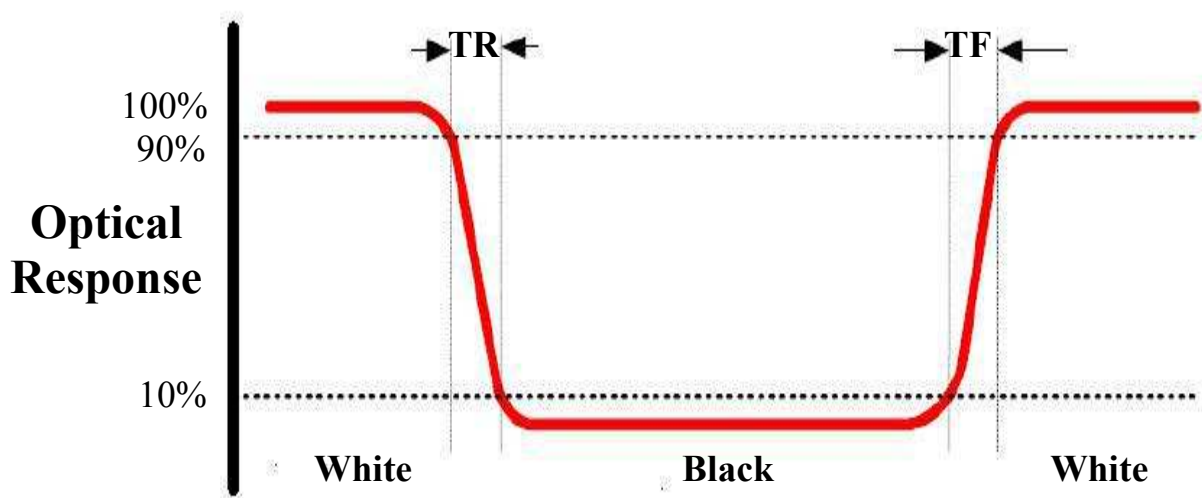
Note 1: Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Luminance of white state}}{\text{Luminance of black state}}$$

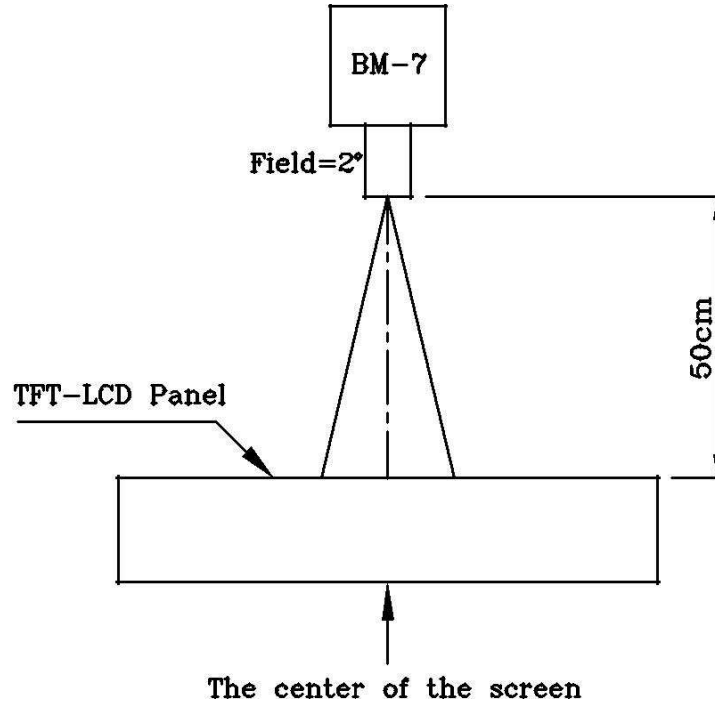
Note 3: Definition of Response Time(T_r, T_f)



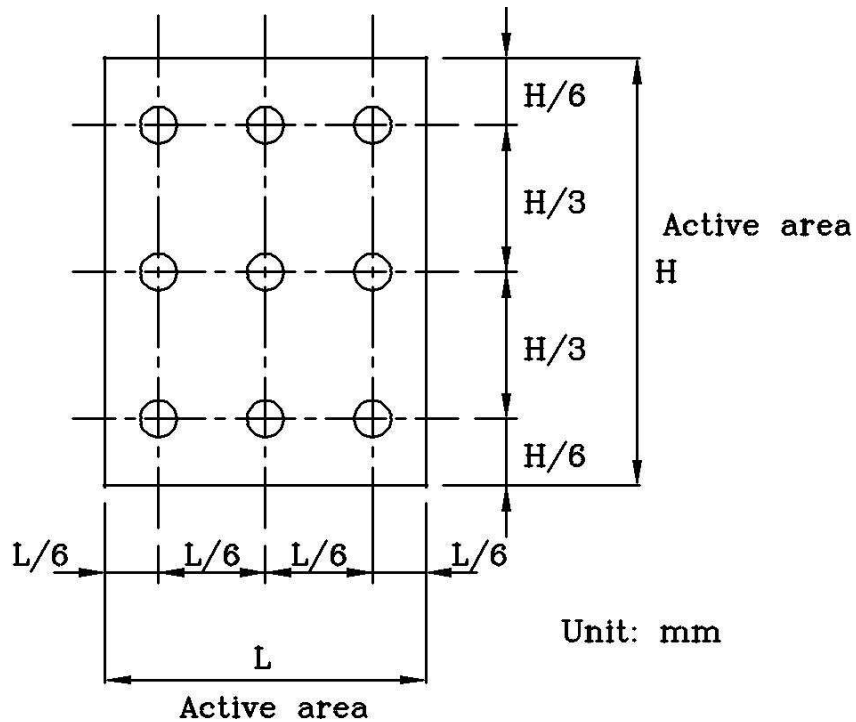
Note 4: Definition of Luminance

①The Brightness Test Equipment Setup

Field=2°(As measuring “black” image, field=2°is the best testing condition)



②The Brightness Test Point Setup



8. Timing Characteristics

8.1 TTL mode data input format

Vertical timing

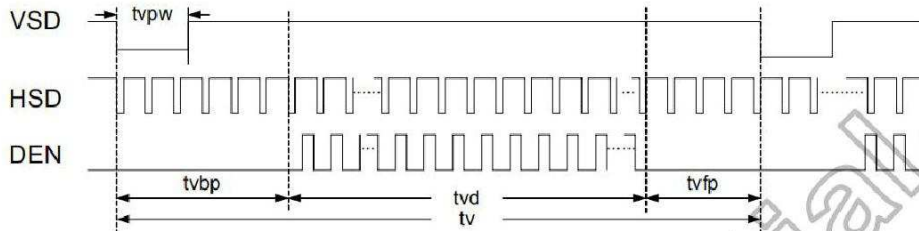


Figure 10.2: Vertical input timing diagram

Horizontal timing

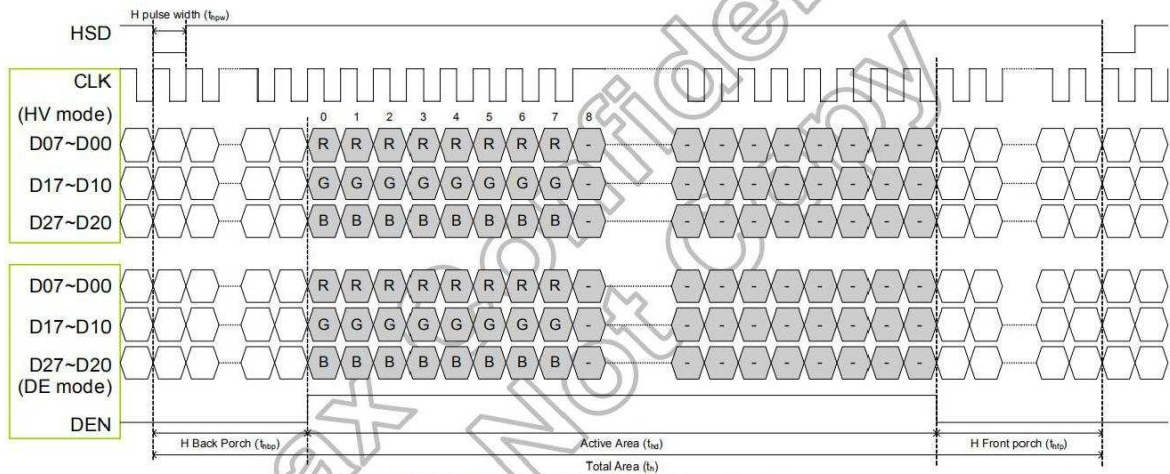


Figure 10.3: Horizontal input timing diagram

8.2 Parallel RGB input timing table

- DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	40.8	51.2	67.2	MHz
Horizontal Display Area	thd	1024			DCLK
HSD Period	th	1114	1344	1600	DCLK
HSD Blanking	thb+ thfp	90	320	376	DCLK
Vertical Display Area	tvd	600			T _H
VSD Period	tvbp	610	635	800	T _H
VSD Blanking	tvbp+ tvfp	10	35	200	T _H

Table 10.4: DE mode (1024x600)

- HV mode

Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	44.9	51.2	63	MHz
Horizontal Display Area	thd	1024			DCLK
HSD Period	th	1200	1344	1400	DCLK
HSD Pulse Width	thpw	1	-	140	DCLK
HSD Back Porch	thbp	160			DCLK
HSD Front Porch	thfp	16	160	216	DCLK

Table 10.5: HV mode horizontal timing (1024x600)

Vertical Timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd	600			T _H
VSD Period	tv	624	635	750	T _H
VSD Pulse Width	tvpw	1	-	20	T _H
VSD Back Porch	tvbp	23			T _H
VSD Front Porch	tvfp	1	12	127	T _H

Table 10.6: HV Mode Vertical Timing (1024x600)

8.3 Output timing table

Parallel 24-bit RGB mode

Parameter	Symbol	Spec.			Unit	Conditions
		Min.	Typ.	Max.		
CLKIN Frequency	Fclk	-	65	71	MHz	VDD=3.0V~3.6V
CLKIN Cycle Time	Tclk	14.1	15.4	-	ns	-
CLKIN Pulse Duty	Tcwh	40	50	60	%	Tclk
Time from HSD to Source Output	Thso	64			CLKIN	-
Time from HSD to LD	Thld	64			CLKIN	-
Time from HSD to STV	Thstv	2			CLKIN	-
Time from HSD to CKV	Thckv	20			CLKIN	-
Time from HSD to OEV	Thoev	4			CLKIN	-
LD Pulse Width	Twld	10			CLKIN	-
CKV Pulse Width	Twckv	66			CLKIN	-
OEV Pulse Width	Twoev	74			CLKIN	-

Table 11.1: Parallel 24-bit RGB mode

9. Standard Specification for Reliability

9.1 Standard Specification for Reliability of LCD Module

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts = +70°C, 240 hours	IEC60068-21:2007 GB2423.2-2008
2	Low Temperature Operation	Ta = -20°C, 240 hours	IEC60068-2-1:2007 GB/2423.1-2008
3	High Temperature Storage	Ta = +80°C, 240 hours	IEC60068-21:2007 GB/2423.2-2008
4	Low Temperature Storage	Ta = -30°C, 240 hours	IEC60068-21:2007 GB/2423.1-2008
5	Storage at High Temperature and Humidity	Ta = +60°C, 90% RH max,240hours	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-30°C 30 min~+80°C 30 min, Change time:5min, 20 Cycle	Start with cold temperature, End with high temperature, IEC60068-214:1984, GB/2423.22-2002
7	ESD	C=150pF,R=330Ω,5point/panel Air:±8Kv,5times; Contact:±4Kv,5times (Environment:15°C~35°C, 30%~60%.86Kpa~106Kpa)	IEC61000-42:2001 GB/T17626.2-2006
8	Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z (6 hours for total)	IEC60068-2-6:1982 GB/T2423.101995
9	Mechanical Shock (Non Op)	Half Sine Wave60G 6ms, ±X,±Y,±Z 3times for each direction	IEC60068-2-27:1987 GB/T2423.5—1995
10	Package Drop Test	Height:80cm, 1corner,3 edges,6 surfaces	IEC60068-2-32:1990 GB/T2423.8—1995

Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of sample.

9.2 Testing Conditions and Inspection Criteria

For the final test, the testing sample must be stored at room temperature for 24 hours. After the tests listed in Table 9.2, standard specifications for reliability will be executed in order to ensure stability.

No.	Item	Test Model	In section Criteria
01	Current Consumption	Refer To Specification	The current consumption should conform to the product specification.
02	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.
03	Appearance	Visual inspection	Defect free.

9.3 MTBF

MTBF	Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature ($25\pm 5^{\circ}\text{C}$), normal humidity ($50\pm 10\%$ RH), and in area not exposed to direct sun light.
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10. Specification of Quality Assurance

This standard of Quality Assurance confirms to the quality of LCD module products supplied by Tecenstar.

10.1 Quality Test

Before delivering, the supplier should conduct the following tests to confirm the quality of products.

- Electrical-Optical Characteristics: According to the individual specification to test the product.
- Appearance Characteristics: According to the individual specification to test the product.
- Reliability Characteristics: According to the definition of reliability on the specification for testing products.

10.2 Delivery Test

Before delivering, the supplier should conduct the delivery test.

- Test method: According to MIL-STD105E.General Inspection Level II take a single Time.
- The defects classify of AQL as following:
Major defect: AQL = 0.65
Minor defect: AQL = 1.5
Total defects: AQL = 1.5

10.3 Non-conforming Analysis & Deal With Manners

10.3.1 Non-conforming Analysis

- Purchaser should provide the data detail of non-conforming sample and the non-conforming.
- After receiving the data detail from purchaser, the analysis of non-conforming should be finished within two weeks.
- If the analysis can't be finished on time, supplier must notice purchaser 3 days in advance.

10.3.2 Disposition of non-conforming

- If any product defect be found during assembling, supplier must change the good for every defect after confirmation.
- Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.

10.4 Agreement items

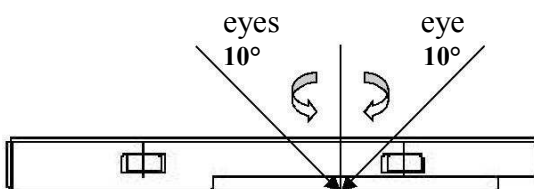
Both parties should negotiate together when the following problems happen.

- There is any problem of standard of quality assurance, and both sides should agree that it must be modified.
- There is any argument item which does not record in the standard of quality assurance.
- Any other special problem.

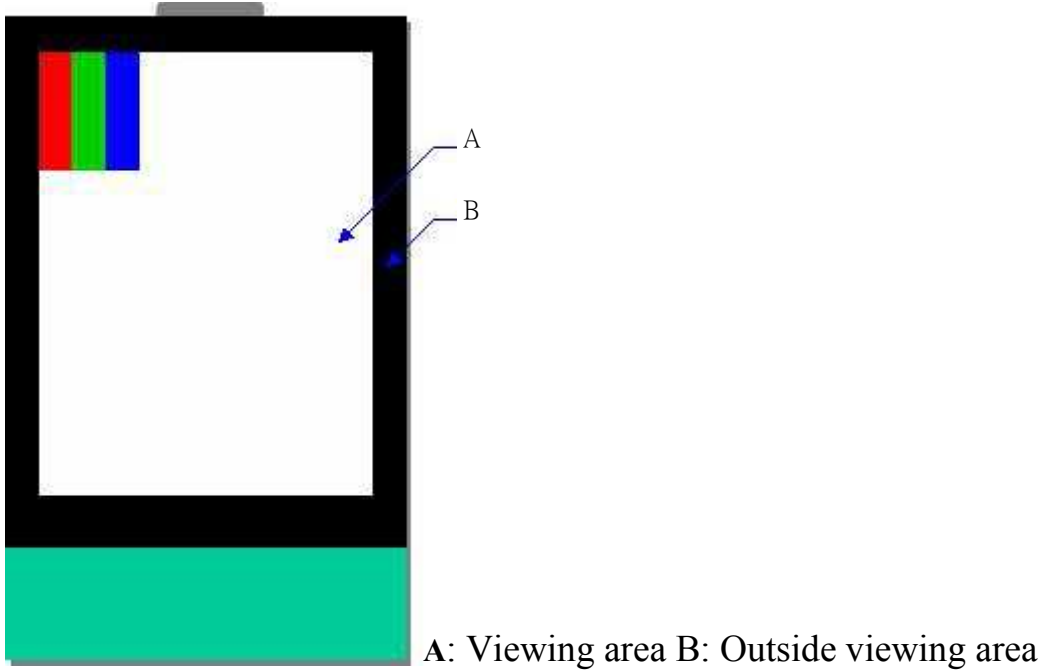
10.5 Standard of The Product Appearance Test

10.5.1 Manner of appearance test

- The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: 25±5°C Humidity: 60±10%RH



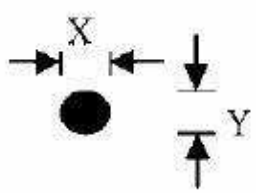
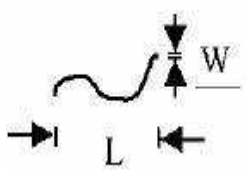
● Definition of area:

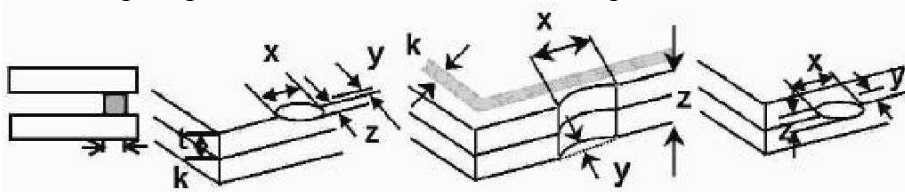
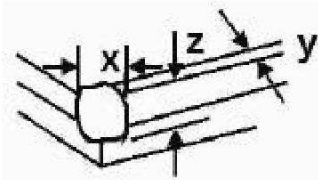


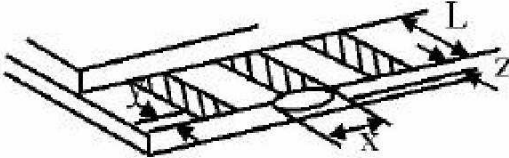
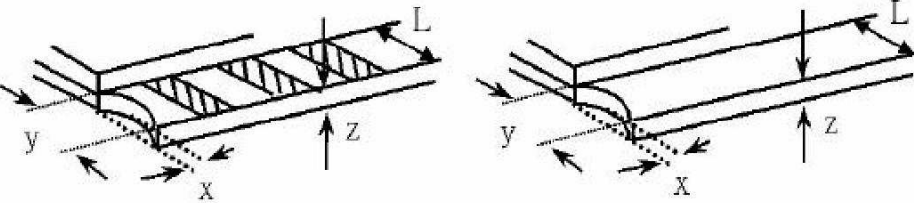
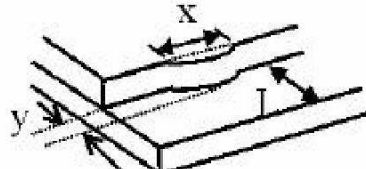
10.5.2 Basic principle

- When the standard can not be described, AQL will be applied.
- The sample of the lowest acceptable quality level must be negotiated by both supplier and customer when any dispute happened.
- New item must be added on time when it is necessary.

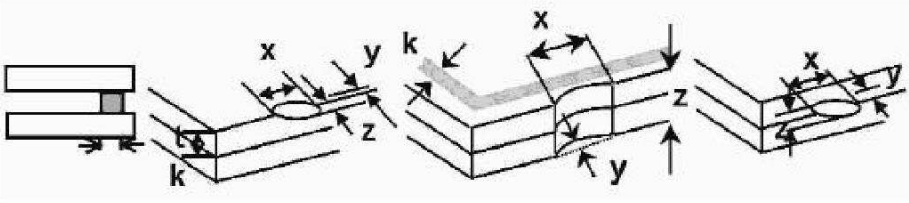
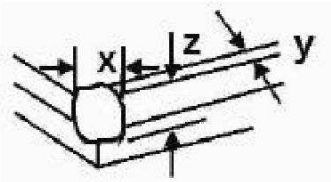
10.6 Inspection Specification

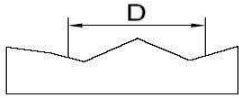
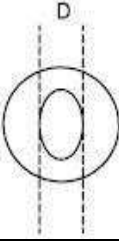
NO.	Item	Criterion	AQL												
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65												
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display $\leq 0.25\text{mm}$, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	1.5												
03	LCD and Touch Panel black spots, white spots, contamination (non - display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table border="1" data-bbox="821 1086 1364 1355"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.10$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.20$</td> <td>2</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.25$</td> <td>2</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.30$</td> <td>1</td> </tr> <tr> <td>$0.30 < \Phi$</td> <td>0</td> </tr> </tbody> </table> <p>* Densely spaced: No more than two spots within 3mm.</p>	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.10$	Accept no dense	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	2	$0.25 < \Phi \leq 0.30$	1	$0.30 < \Phi$	0	1.5
		Size(mm)	Acceptable Q'ty												
$\Phi \leq 0.10$	Accept no dense														
$0.10 < \Phi \leq 0.20$	2														
$0.20 < \Phi \leq 0.25$	2														
$0.25 < \Phi \leq 0.30$	1														
$0.30 < \Phi$	0														
3.2 Line type: (As following drawing)  <table border="1" data-bbox="726 1489 1364 1780"> <thead> <tr> <th>Length(mm)</th> <th>Width(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.02$</td> <td>Accept no dense</td> </tr> <tr> <td>$L \leq 3.0$</td> <td>$0.02 < W \leq 0.05$</td> <td rowspan="2">2</td> </tr> <tr> <td>$L \leq 2.5$</td> <td>$0.03 < W \leq 0.08$</td> </tr> <tr> <td>---</td> <td>$0.08 < W$</td> <td>Rejection</td> </tr> </tbody> </table> <p>* Densely spaced: No more than two lines within 3mm.</p>	Length(mm)	Width(mm)	Acceptable Q'ty	---	$W \leq 0.02$	Accept no dense	$L \leq 3.0$	$0.02 < W \leq 0.05$	2	$L \leq 2.5$	$0.03 < W \leq 0.08$	---	$0.08 < W$	Rejection	1.5
Length(mm)	Width(mm)	Acceptable Q'ty													
---	$W \leq 0.02$	Accept no dense													
$L \leq 3.0$	$0.02 < W \leq 0.05$	2													
$L \leq 2.5$	$0.03 < W \leq 0.08$														
---	$0.08 < W$	Rejection													

NO.	Item	Criterion	AQL									
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction	Size Φ (mm)	Acceptable Q'ty								
			\leq	Accept no dense								
			$0.30 < \Phi \leq 0.50$	0								
			$0.50 < \Phi \leq 1.00$	0								
			$1.00 < \Phi$	0								
		Total Q'ty	0									
05	Scratches	Follow NO.3 -2 Line Type.										
06	Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length										
		6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels:										
												
		<table border="1"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <tr> <td>$Z \leq 1/2t$</td> <td>Not over viewing area</td> <td>$x \leq 2MM$</td> </tr> <tr> <td>$1/2t < z \leq 2t$</td> <td>Not exceed 1/3k</td> <td>$x \leq 2MM$</td> </tr> </tbody> </table>	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 2MM$	$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 2MM$	
		z: Chip thickness	y: Chip width	x: Chip length								
$Z \leq 1/2t$	Not over viewing area	$x \leq 2MM$										
$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 2MM$										
⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 6.1.2 Corner crack: 												
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z: Chip thickness	y: Chip width	x: Chip length										
$Z \leq 1/2t$	Not over viewing area	$x \leq 2MM$										
$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 2MM$										
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip	1.5									

NO.	Item	Criterion	AQL																
07	Glass crack	<p>Symbols: 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>7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:</p>  <table border="1" data-bbox="558 716 1236 862"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td>$y \leq 0.5\text{mm}$</td> <td>$x \leq 2\text{MM}$</td> <td>$0 < z \leq t$</td> </tr> </table> <p>7.2.2 Non-conductive portion:</p>  <table border="1" data-bbox="558 1232 1236 1377"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td>$y \leq L$</td> <td>$x \leq 2\text{MM}$</td> <td>$0 < z \leq t$</td> </tr> </table> <p>7.2.3 Substrate protuberance and internal crack</p>  <table border="1" data-bbox="885 1702 1324 1848"> <tr> <td>y: width</td> <td>x: length</td> </tr> <tr> <td>$y \leq 1/3L$</td> <td>$X \leq 2\text{MM}$</td> </tr> </table> <p>⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged.</p>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 2\text{MM}$	$0 < z \leq t$	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 2\text{MM}$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$X \leq 2\text{MM}$	1.5
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq 0.5\text{mm}$	$x \leq 2\text{MM}$	$0 < z \leq t$																	
y: Chip width	x: Chip length	z: Chip thickness																	
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y: width	x: length																		
$y \leq 1/3L$	$X \leq 2\text{MM}$																		

NO.	Item	Criterion	AQL
08	Cracked glass	No crack is allowed.	1.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	1.5 1.5 0.65
10	Bezel	No scratches with W>0.1 and Length>2.5mm.	1.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	1.5 1.5 1.5 1.5 0.65 0.65
12	FPC	FPC damage per IPC guidelines.(IPC-A-610) Nicks or damage along the edges of the flexible printed circuitry and cutouts,providing the penetration does not exceed 50% of the distance from the edge to the nearest conductor to 2.5mm[0.1in], Whichever is less.	1.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC. 13.3 Soldering per IPC guidelines.(IPC-A-610)	1.5 0.65

NO.	Item	Criterion	AQL												
14	Touch Panel Chipped glass	<p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Touch Panel Total thickness a: LCD side length L: Electrode pad length</p> <p>14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="451 750 1270 969"> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$Z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 2MM$</td> </tr> </table> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>14.1.2 Corner crack:</p>  <table border="1" data-bbox="451 1346 1270 1565"> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 2MM$</td> </tr> </table> <p>⊙ Unit: mm ⊙ 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	$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 2MM$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 2MM$	1.5
z: Chip thickness	y: Chip width	x: Chip length													
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z: Chip thickness	y: Chip width	x: Chip length													
$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 2MM$													

NO.	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table border="1" data-bbox="443 344 981 551"> <thead> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.2$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.2 < D \leq 0.4$</td> <td>5</td> </tr> <tr> <td>$0.4 < D \leq 0.5$</td> <td>2</td> </tr> <tr> <td>$0.5 < D$</td> <td>0</td> </tr> </tbody> </table>  	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dense	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	1.5
SIZE(mm)	Acceptable Q'ty												
$\Phi \leq 0.2$	Accept no dense												
$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	0												
16	Touch Panel Newton ring	Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$) , it is acceptable.	1.5										
17	Touch Panel Linearity	Less than 1.5% is acceptable.	1.5										
18	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	1.5										
19	General appearance	19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65										

11. Handling Precaution

11.1 Handling of LCM

- Avoid external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance, do not lick or swallow. When the liquid is attaching to your hand, skin, cloth, etc., wash it thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.
- The operators should wear protections whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- The modules should be kept in antistatic bags or other containers resistant to static for storage.
- The module is coated with a film to protect the display surface, be careful when peeling off this protective film since static electricity may be generated.

11.2 Storage

- Store it in an ambient temperature of $25\pm 10^{\circ}\text{C}$, and in a relative humidity of $50\pm 10\%\text{RH}$. Don't expose to sunlight or fluorescent light.
- Store it in a clean environment, free from dust, active gas, and solvent.
- Store it in anti-static electricity container.
- Store it without any physical load.

11.3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: no higher than $280\pm 10^{\circ}\text{C}$ and less than 3 sec during hand soldering.
- Rewiring: no more than 2 times.

12.Packing Method

No.	Item	Dimensions(mm)	Quantity	Remark
1	LCM Module	235.00*143.00*5.00	12PCS	
2	Pallet	345*285*175 (include 12pcs products/one pallet)	1PCS	
3	Carton	385*315*227 (include 12pcs products/one carton)	1PCS	