



**SPECIFICATION
FOR
LCD MODULE**

**MODULE NO: AFK1024600A0-7.0INTM
REVISION NO: V01**

Customer's Approval:

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	SIGNATURE	DATE
PREPARED BY (RD ENGINEER)		
CHECKED BY		
APPROVED BY		

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1. General Specification

Item	Contents	Unit
LCD TYPE	TFT/TRANSMISSIVE	
MODULE SIZE (W*H*T)	164.80*99.80*5.50	MM
ACTIVE SIZE (W*H)	154.21*85.92	MM
PIXEL PITCH (W*H)	0.1506*0.1432	MM
NUMBER OF DOTS	1024*600	
DRIVER IC	ILI5120+ILI6150C	
INTERFACE TYPE	LVDS	
TOP POLARIZER TYPE	ANTI-GLARE	
RECOMMEND VIEWING DIRECTION	ALL	O'CLOCK
GRAY SCALE INVERSION DIRECTION	-	O'CLOCK
BACKLIGHT TYPE	27-CHIP WHITE LED	
TOUCH PANEL TYPE	WITHOUT	

2. Mechanical Drawing

Dimensions: 164.80±0.3, 135±0.2, 107.21±0.25, 156.22±0.25, 154.21±0.25, 7.05±0.2, 2.05±0.2, 3.5±0.2, 4.49, 85.92 MA, 87.92±0.2(PQL), 88.92±0.2(K), 99.80±0.3, 46.98±0.5, 47.24±0.5, 5.90±0.3, 0.5, 4.0±0.30, 20.59±0.1, 70.54±0.19±0.20, 6.75±0.3, 4.67±0.3, 4.67±0.3, 10.0, 49.12±0.2, 0.39±0.05, 5.30±0.3

70° TFT
1024RGB*600

PIN DESCRIPTION

PIN NO	SYMBOL	DESCRIPTION
1	VCOM	VCOM
2	AVDD	AVDD
3	NC	NC
4	NC	NC
5	RRESFT	RRESFT
6	SRESFT	SRESFT
7	AVDD	AVDD
8	AVDD	AVDD
9	AVDD	AVDD
10	AVDD	AVDD
11	AVDD	AVDD
12	AVDD	AVDD
13	AVDD	AVDD
14	AVDD	AVDD
15	AVDD	AVDD
16	AVDD	AVDD
17	AVDD	AVDD
18	AVDD	AVDD
19	AVDD	AVDD
20	AVDD	AVDD
21	AVDD	AVDD
22	AVDD	AVDD
23	NC	NC
24	NC	NC
25	AVDD	AVDD
26	AVDD	AVDD
27	AVDD	AVDD
28	AVDD	AVDD
29	AVDD	AVDD
30	AVDD	AVDD
31	AVDD	AVDD
32	AVDD	AVDD
33	AVDD	AVDD
34	AVDD	AVDD
35	AVDD	AVDD
36	AVDD	AVDD
37	AVDD	AVDD
38	VGH	VGH
39	AVDD	AVDD
40	AVDD	AVDD

LED CIRCUIT DIAGRAM
9.6V@2.25mA

Display Type: TFT
Transmissive: NB
Viewing Angle: ALL VIEWING
LCD Driver IC: ILI5120+LI16150C
Operating Voltage: VDD=3.3V
Operation Temperature: -20°C TO 70°C
Storage Temperature: -30°C TO 80°C
Interface: LVDS
Backlight: 27-CHIP WHITE LED
Surface luminance: 450 cd/m² (Typ.)
White X/Y: ---

注意: 铁框开口, 左边有卡偏光片的风险

NOTES:

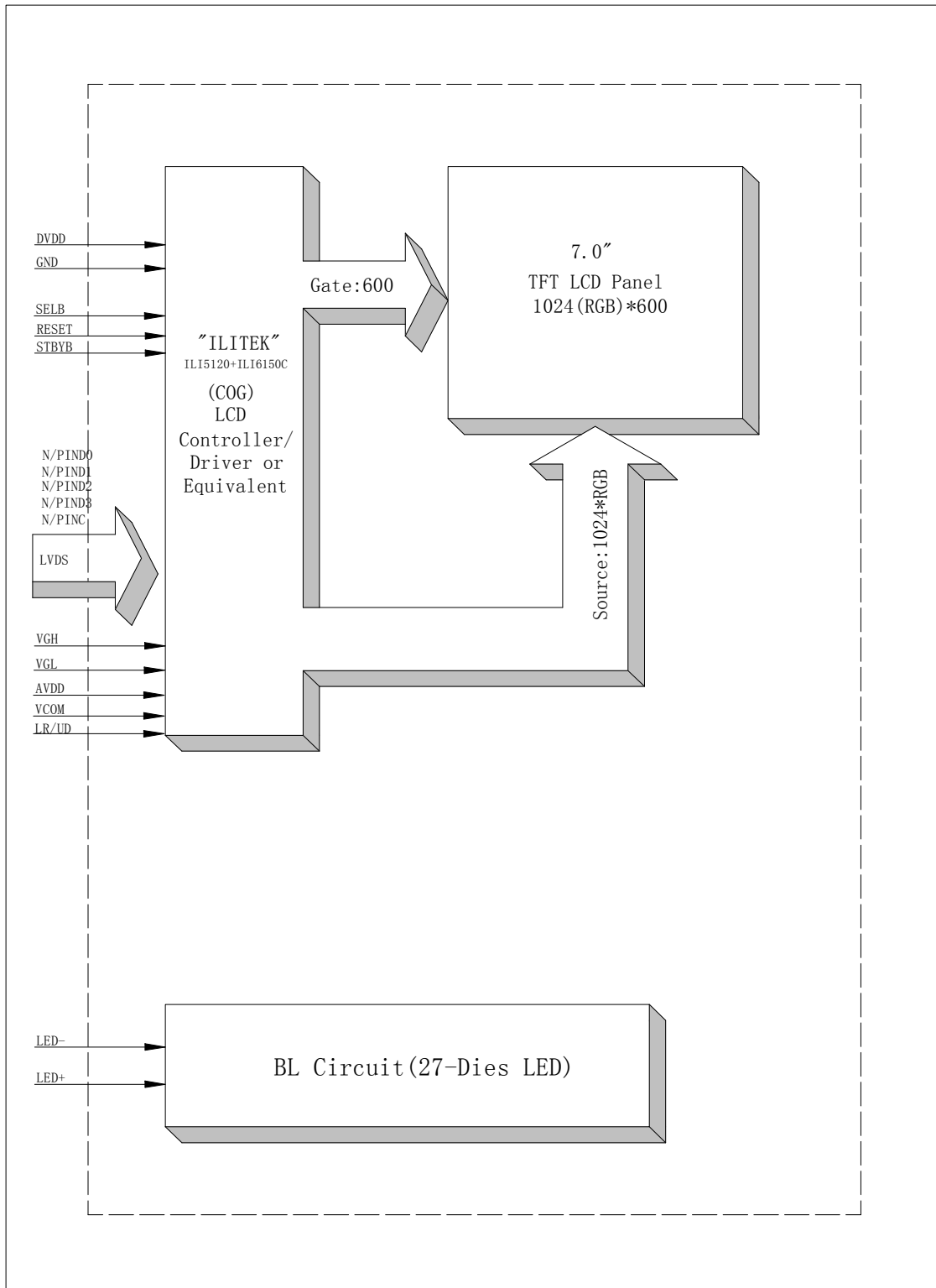
- General Tolerance: ±0.2
- () reference dimension.
- Recommended Case Open Area Should Be Less Than Module V.A
- recommended cushion adherent. orient: P V.A+1.6mm
- ROHS MUST BE COMP-LINK!

DRAWING NO.		TITLE	
AFK1024600A0-7.0INTM	UNIT: mm	MODULE SPEC.	SCALE: FIT
3rd Angle		SHEET 1 OF 1	

DRAWN	ME-CHECKED	BE-CHECKED	APPROVED	CUSTOMER'S APPROVAL

VER.	SYMBOL	AMENDMENT	SIGN	DATE
V02		Change the window size of the iron frame		2018.12.18B
V01		modify bezel open		2016.09.28A
V00		First Issue		2014.8.8A

3. Block Diagram



4. Interface Pin Function

Pin No.	Symbol	Description
1	VCOM	Common Voltage
2	DVDD	Power Voltage for digital circuit
3	DVDD	Power Voltage for digital circuit
4	NC	No connection
5	Reset	Global reset pin
6	STBYB	Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z
7	GND	Power ground
8	NIND0	-LVDS differential data input
9	PIND0	+ LVDS differential data input
10	GND	Power ground
11	NIND1	-LVDS differential data input
12	PIND1	+ LVDS differential data input
13	GND	Power ground
14	NIND2	-LVDS differential data input
15	PIND2	+ LVDS differential data input
16	GND	Power ground
17	NINC	-LVDS differential data input
18	PINC	+ LVDS differential data input
19	GND	Power ground
20	NIND3	-LVDS differential data input
21	NIND3	+ LVDS differential data input
22	GND	Power ground
23	NC	No connection
24	NC	No connection
25	GND	Power ground
26	NC	No connection
27	NC	No connection
28	SELB	6bit/8bit mode select
29	AVDD	Power for Analog Circuit
30	GND	Power ground
31	LED-	LED Cathode
32	LED-	LED Cathode
33	SHLR	Horizontal inversion
34	UPDN	Vertical inversion
35	VGL	Gate OFF Voltage
36	NC	No connection
37	NC	No connection
38	VGH	Gate ON Voltage

39	LED+	LED Anode
40	LED+	LED Anode

5. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	DVDD	-0.3	5	V
Supply voltage for analog	AVDD	-0.5	13.5	V
Power supply	VGH	-0.3	40	V
Power supply	VGL	-20	0.3	V
Power supply	VGH-VGL	-	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 Analog	DVDD	3.0	3.3	3.6	V	
Supply Voltage for Logic	AVDD	9.4	9.6	9.8	V	
Power supply	VGH	17	18	19		
Power supply	VGL	-6.6	-6	-5.4		
Power supply	VCOM		3.15			
Input Voltage	V _{IL}	0	-	0.3DVDD	V	
	V _{IH}	0.7 DVDD	-	DVDD		
Input leakage Current	I _{LKG}	-		-	μA	

6.2 Backlight Driving Conditions

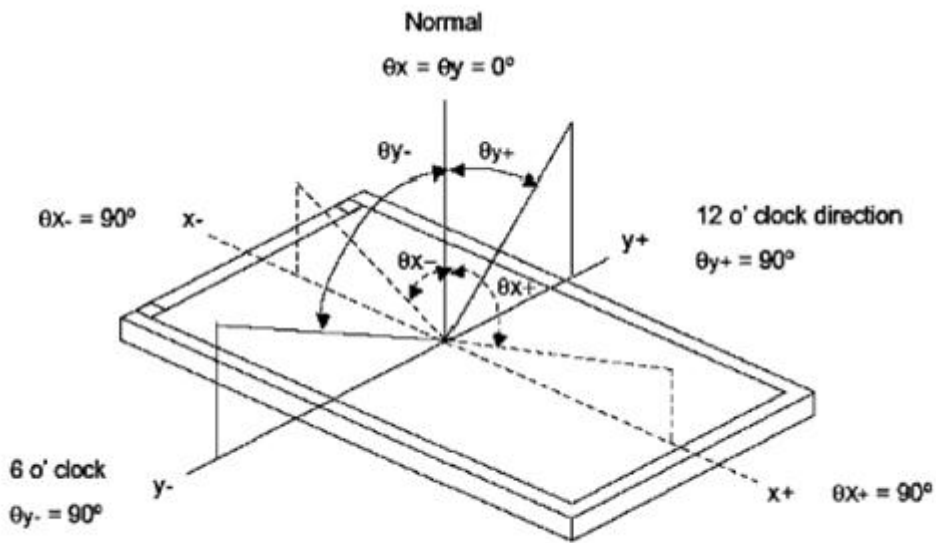
Item	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V _F	8.4	9.6	10.8	V	I _L =225mA
Current for LED Backlight	I _L		225		mA	
Power Consumption	P		2.16		W	
LED Life Time		30,000	50,000		Hr	Note

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	$I_L = 225\text{mA}$	360	450	540	Cd/m^2		
Contrast Ratio	CR	$\theta = 0^\circ$	600	800				
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		0.230	0.270	0.310		
		Y_W		0.250	0.290	0.330		
Viewing Angle	Hor.	θ_{X+}		80	85		Degree	
		θ_{X-}		80	85			
	Ver.	θ_{Y+}		80	85			
		θ_{Y-}		80	85			
Uniformity	Un			70	75		%	

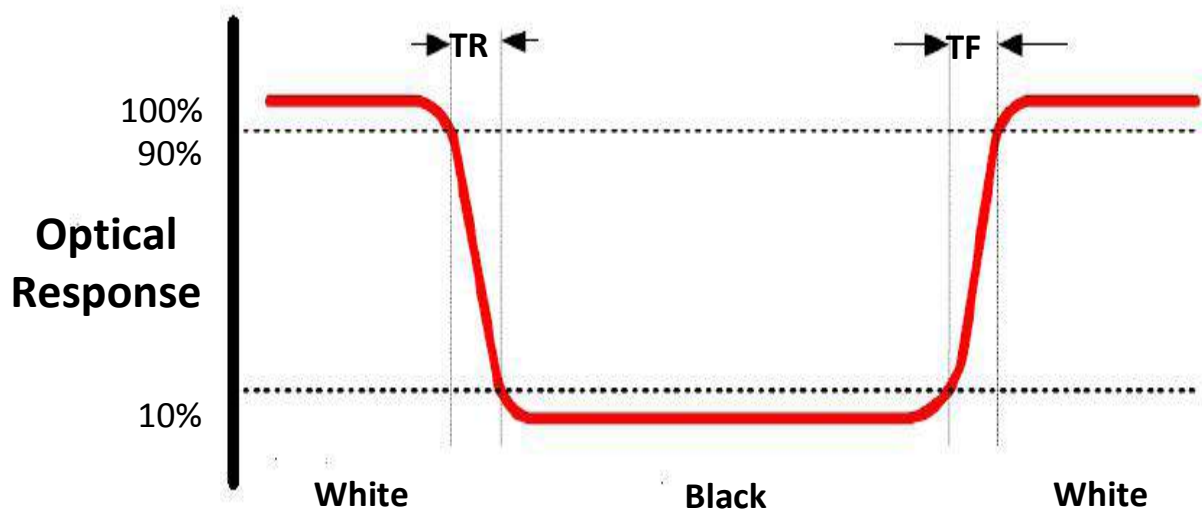
Note 1: Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

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

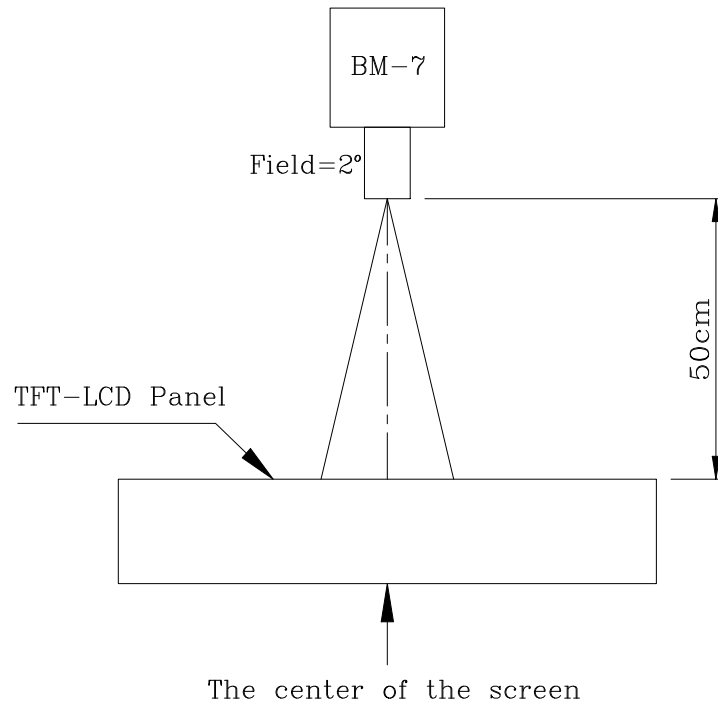
Note 3: Definition of Response Time (T_r, T_f)



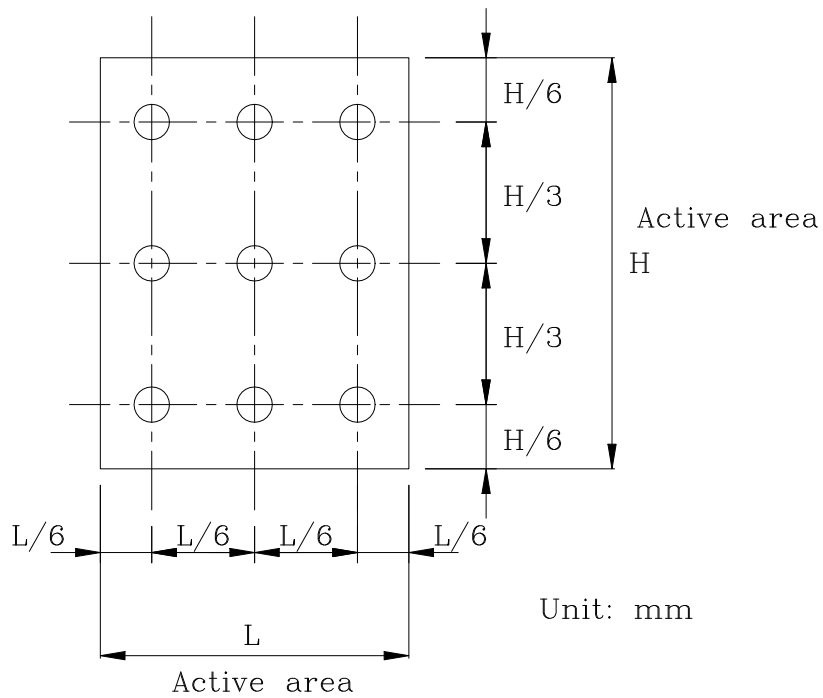
Note 4: Definition of Luminance

① The Brightness Test Equipment Setup

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



② The Brightness Test Point Setup

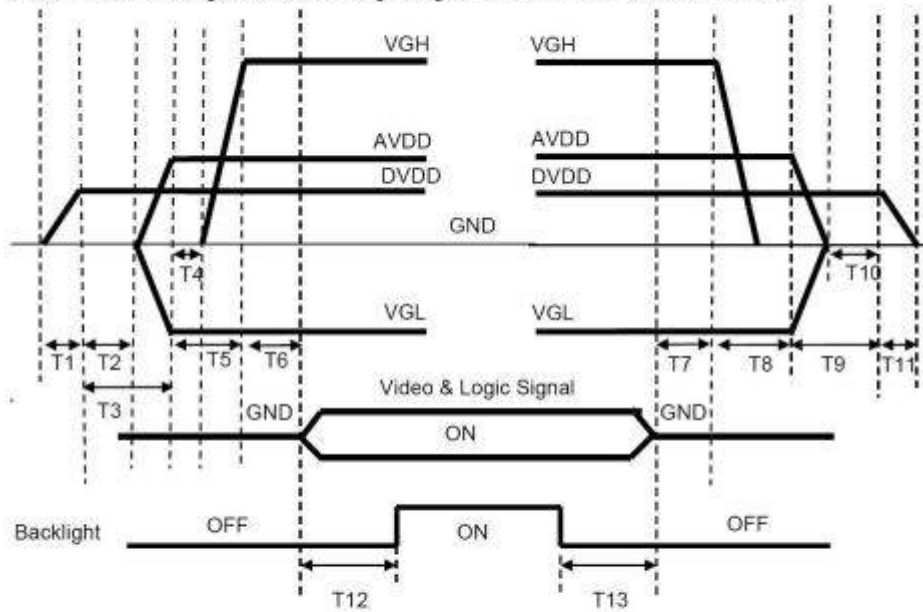


8. Timing Characteristics

8.1 Power Sequence

Power On : DVDD→AVDD/VGL →VGH →Video & Logic Signal→Backlight

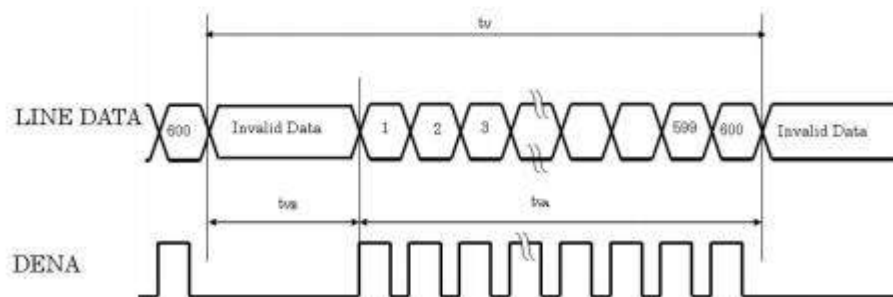
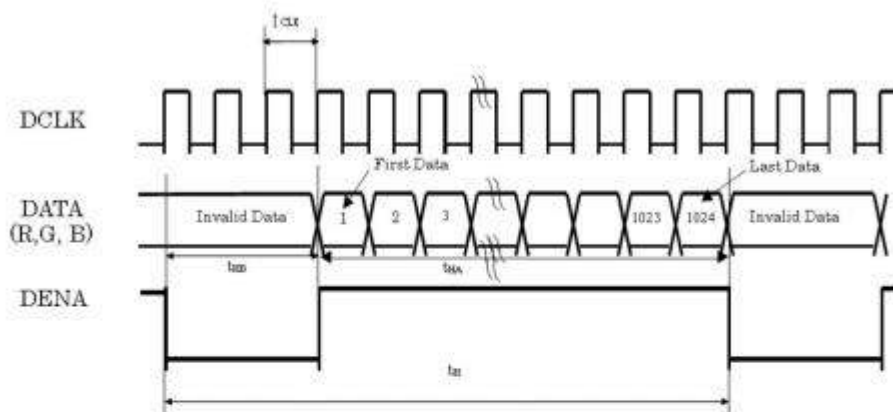
Power Off : Backlight→Video & Logic Signal→ VGH→AVDD/VGL→DVDD



$0 < T1 \leq 10\text{ms}$
 $T2 > 0\text{ms}$
 $T3 > 20\text{ms}$
 $T4 > 0\text{ms}$
 $T5 > 10\text{ms}$
 $0 < T6 \leq 10\text{ms}$
 $T12 \geq 200\text{ms}$

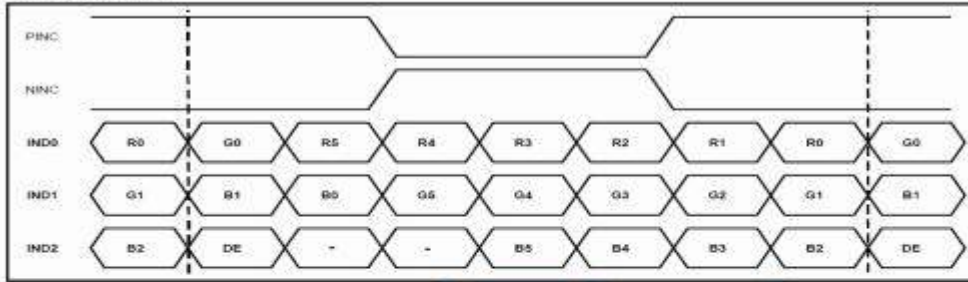
$T7 > 0\text{ms}$
 $T8 > 0\text{ms}$
 $T9 > 0\text{ms}$
 $T10 > 0\text{ms}$
 $0 < T11 \leq 10\text{ms}$
 $T13 \geq 200\text{ms}$

8.2 Input data format

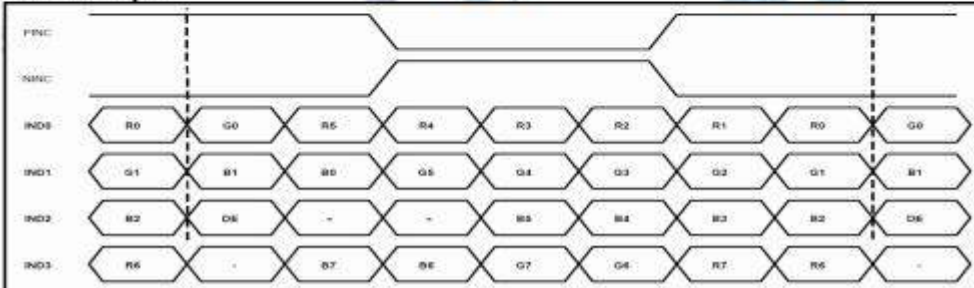


8.3 Data input format

6bit LVDS input



8bit LVDS input



Note: Support DE timing mode only, SYNC mode not supported.

8.4 TIMING

ITEM		SYMBOL	MIN	TYP	MAX	UNIT	
LVDS Input Signal Sequence	CLK Frequency	f_{clk}	45	51.2	57	MHz	
LCD Input Signal Sequence (Input LVDS Transmitter)	Horizontal	Horizontal Total Time	t_{H1}	1324	1344	1364	tCLK
		Horizontal Effective Time	t_{H2}	1024			tCLK
		Horizontal Blank Time	t_{H3}	300	320	340	tCLK
	Vertical	Vertical Total Time	t_{V1}	625	635	645	t_{H1}
		Vertical Effective Time	t_{V2}	600			t_{H1}
		Vertical Blank Time	t_{V3}	25	35	45	t_{H1}

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, 240 hours	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 ODNA.

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

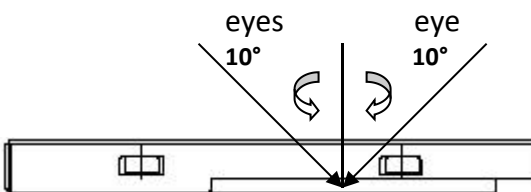
Both parties should negotiate together when the following problems happen.

- 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.

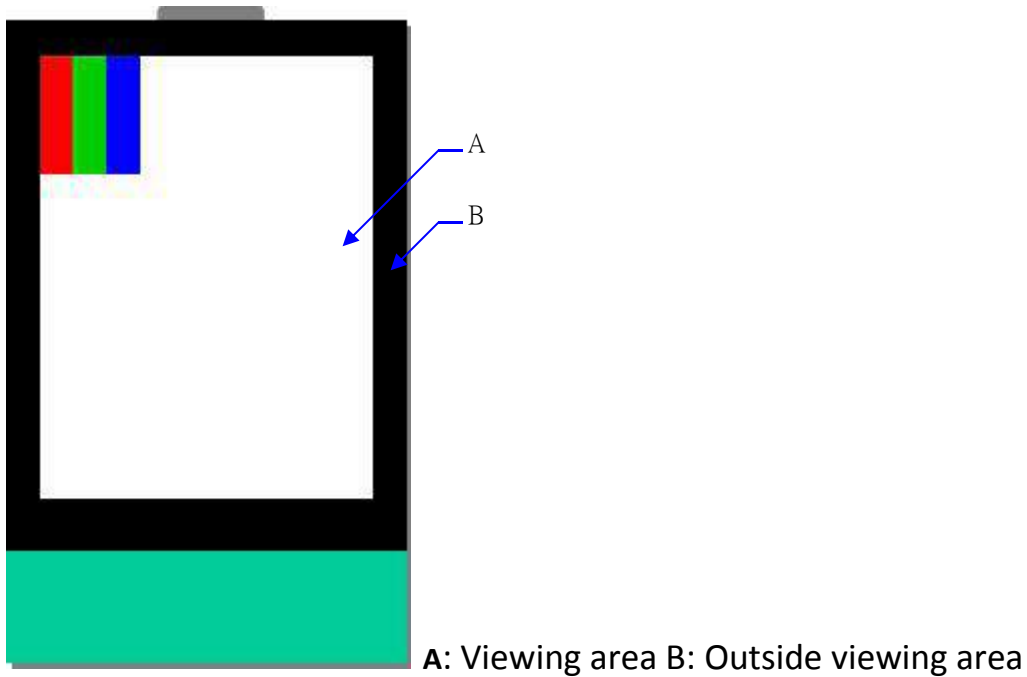
10.5 Standard of The Product Appearance Test

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 $30\pm 5\text{cm}$.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: $25\pm 5^\circ\text{C}$ Humidity: $60\pm 10\%\text{RH}$



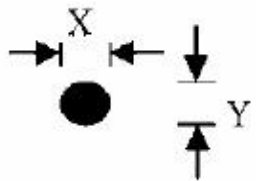
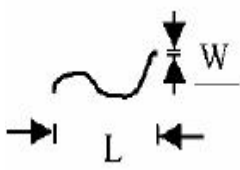
- Definition of area:

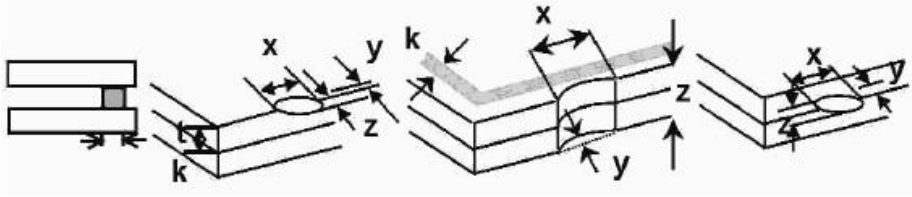
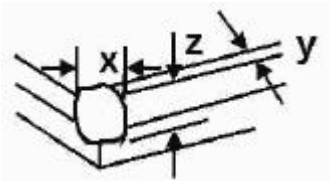


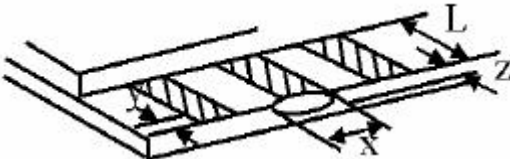
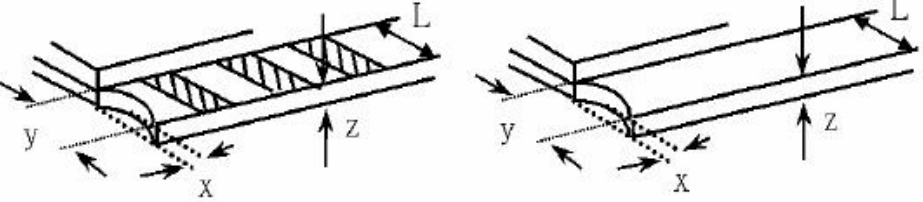
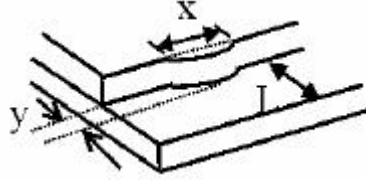
10.5.2 Basic principle

- 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.

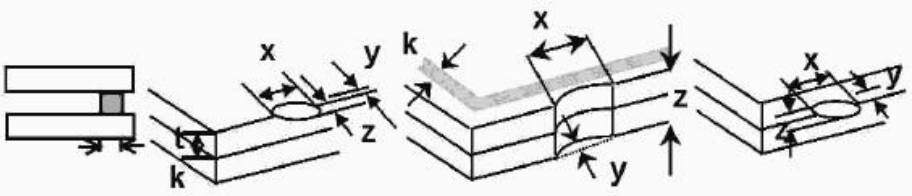
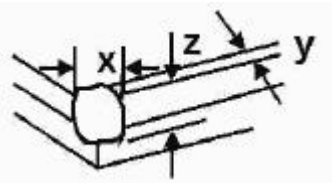
10.6 Inspection Specification

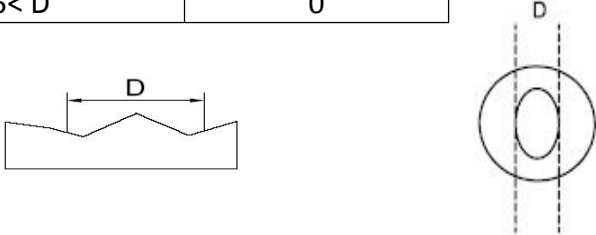
NO.	Item	Criterion	AQL												
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 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 1164 1356 1422"> <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>1</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.25$</td> <td>1</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.30$</td> <td>0</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	$0.10 < \Phi \leq 0.20$	1	$0.20 < \Phi \leq 0.25$	1	$0.25 < \Phi \leq 0.30$	0	$0.30 < \Phi$	0	1.5
		Size(mm)	Acceptable Q'ty												
$\Phi \leq 0.10$	Accept no dense														
$0.10 < \Phi \leq 0.20$	1														
$0.20 < \Phi \leq 0.25$	1														
$0.25 < \Phi \leq 0.30$	0														
$0.30 < \Phi$	0														
3.2 Line type: (As following drawing)  <table border="1" data-bbox="726 1545 1356 1792"> <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>$L < 2.5$</td> <td>$W < 0.08$</td> <td>1</td> </tr> <tr> <td>---</td> <td>$0.08 \leq W$</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	$L < 2.5$	$W < 0.08$	1	---	$0.08 \leq W$	Rejection	1.5		
Length(mm)	Width(mm)	Acceptable Q'ty													
---	$W \leq 0.02$	Accept no dense													
$L < 2.5$	$W < 0.08$	1													
---	$0.08 \leq W$	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	1.5
			$\Phi \leq 0.30$	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:		1.5	
					
		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:			
					
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					

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="558 728 1236 884"> <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 1265 1236 1422"> <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>⊙ 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> <p>7.2.3 Substrate protuberance and internal crack</p>  <table border="1" data-bbox="885 1758 1316 1892"> <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>	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																	
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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 cir-cuitry 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="451 768 1270 981"> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$Z \leq t$</td> <td>$\cong 1/2 k$ and not over viewing area</td> <td>$x \leq 2\text{MM}$</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 1384 1270 1597"> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$z \leq t$</td> <td>$\cong 1/2 k$ and not over viewing area</td> <td>$x \leq 2\text{MM}$</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	$Z \leq t$	$\cong 1/2 k$ and not over viewing area	$x \leq 2\text{MM}$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\cong 1/2 k$ and not over viewing area	$x \leq 2\text{MM}$	1.5
z: Chip thickness	y: Chip width	x: Chip length													
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NO.	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table border="1" data-bbox="443 405 978 613"> <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 2.5% 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. 19.5 product packaging shall be by trays sized to protect tft and fpc cable, 19.6 cable shall not be bent during transportation. 19.7top tray must be empty.	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	164.8*99.8*5.5	88PCS	
2	PALLET	375*320*212 (include 88pcs products/one tray)	1PCS	
3	CARTON	405*355*260 (include 88pcs products/one carton)	1PCS	