



JEWEL HILL ELECTRONIC CO.,LTD.



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SPECIFICATIONS FOR LCD MODULE

Module No. JH70800480A

E-mail: sales@jhlcd.com

Website: www.jhlcd.com

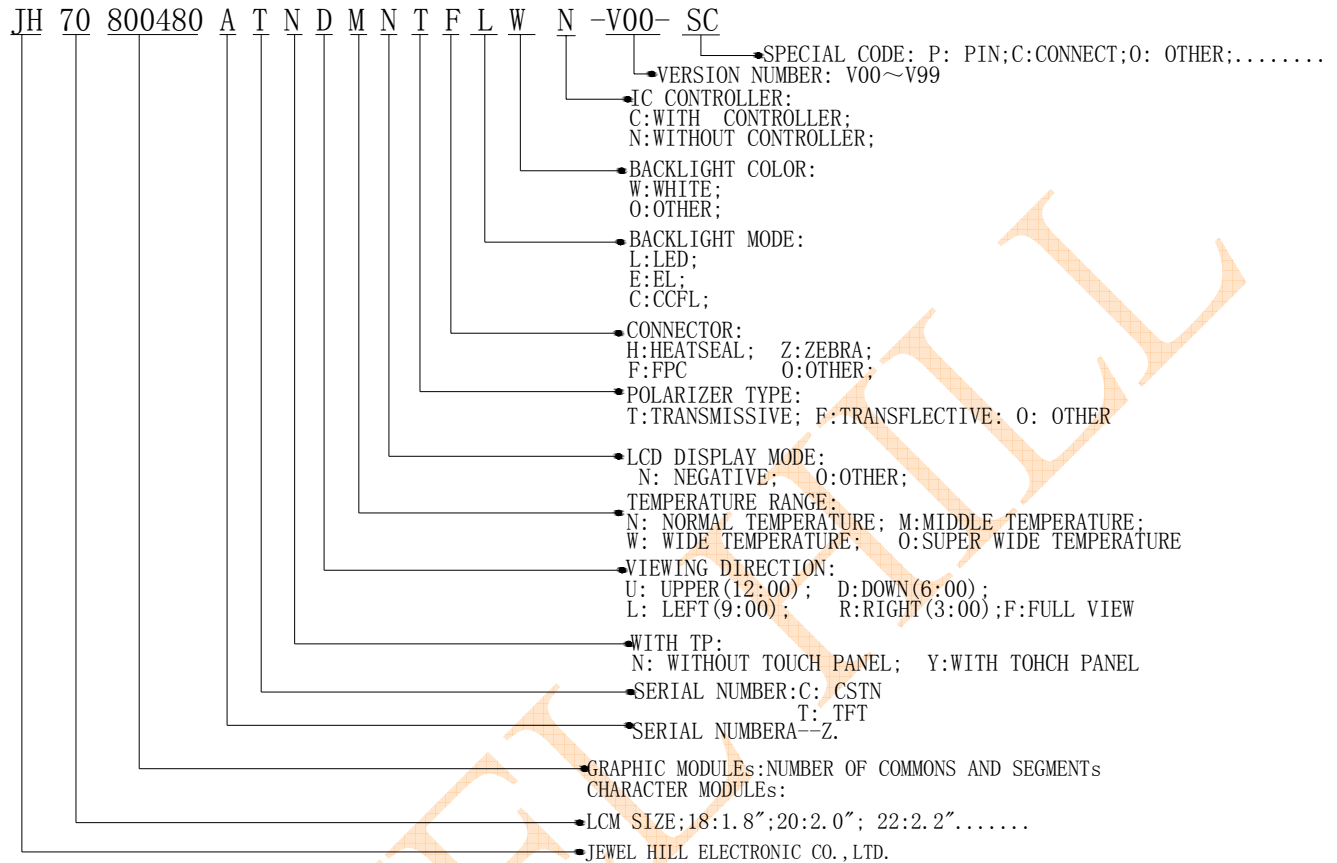
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SAMPLE APPROVED REPORT



LCM Number System





1. General Description

JH70800480A is a 800RGB*480 dots matrix TFT LCD module. It has a TFT panel composed of 2400 sources and 480gates. The LCM can be easily accessed by micro-controller.

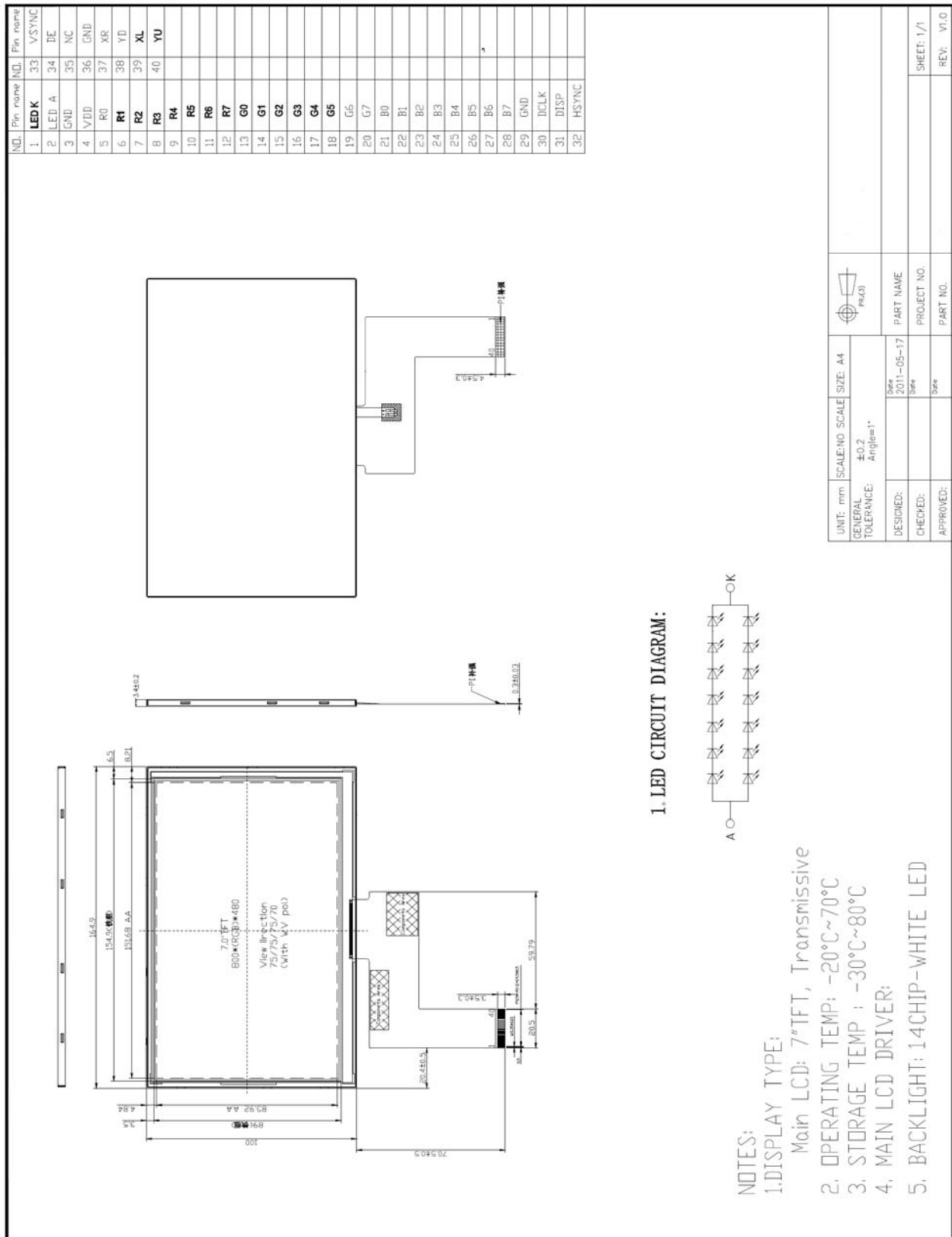
2. Features

Display Mode	Transmissive
	a-TFT
Display Format	Graphic 800RGB*480 Dot-matrix
Input Data	RGB interface
Viewing Direction	6:00 o'clock
Drive	OTA7001A_V03

3. Mechanical Specification

Item	Specifications	Unit
Dimensional outline	164.9(W)*100(H)*3.4	mm
Resolution	800RGB*480	dots
LCD Active area	151.68(W)*85.92(H)	mm
Pixel size	0.063(W)*0.179(H)	mm

4. Mechanical Dimension





5. Maximum Ratings.

Item	Symbol	min	max	Unit	Note
Supply voltage	V _{CI}	3.0	3.6	V	
Operating temperature	T _{OPR}	-10	60	°C	
Storage temperature	T _{STR}	-20	70	°C	

6. Electrical Characteristic

Item	Symbol		Condition	Min.	Typ.	Max.	Unit
Supply voltage	Logic	V _{CC}	—	2.7	3.3	3.5	V
Input Voltage	H level	T _{IH}	—	0.8*IOVCC	—	IOVCC	V
	L level	T _{IL}	—	-0.3	—	0.2*IOVCC	V
Storage temperature	I _{DD} /I _{CC}	—	VCC=3.3V; Temp=25°C /DCLK=9MHz	—	8.0	—	mA

7. Backlight Characteristic.

Item	Symbol	Min	Typ.	Max	Unit
LED module Forward voltage	V _{LED}	21	22.4	23.8	V
LED module current	V _{LED}	—	40	—	mA
L/G Surface Luminance ★1	L _S	4200	4600	—	Cd/m ²
LCM Surface brightness uniform ★2	L _D	80	—	—	%

★ 1Test condition is:

(a) Center point on active area.

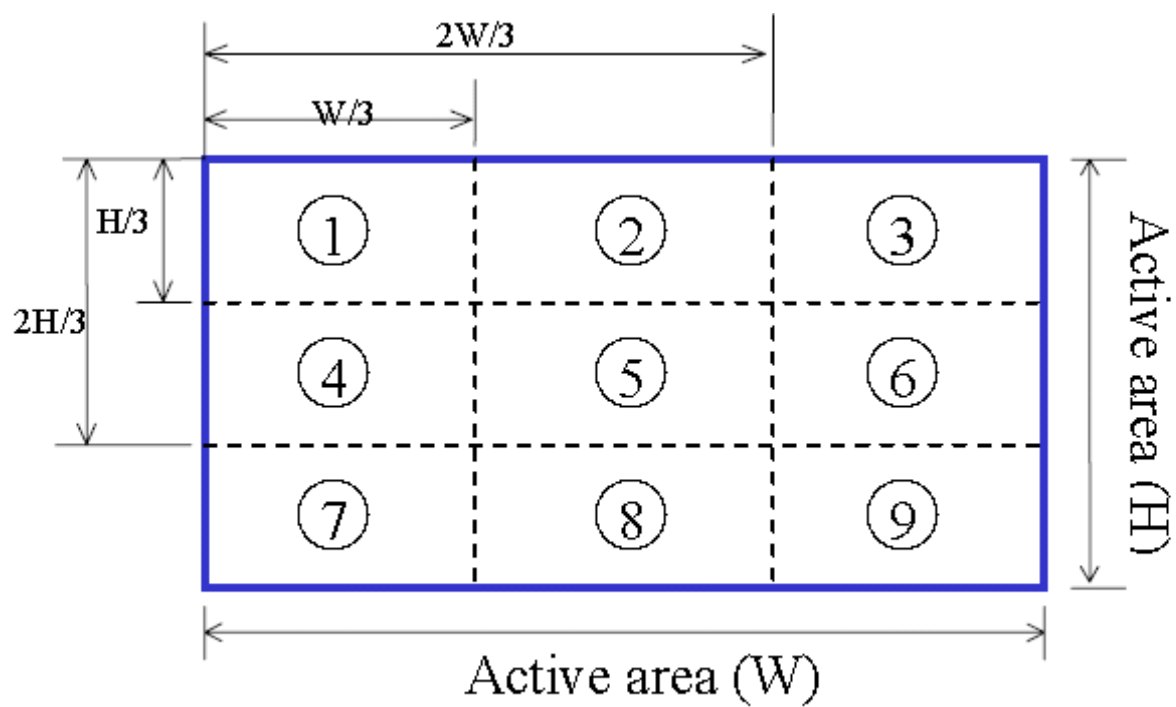
(b)Best Contrast.

★2Uniform measure condition:

(1)Measure 9 point. Measure location show below;

(2)Uniform=(Min. brightness /Max. brightness)*100%

(3)Best Contrast.



8.Module Function Description

8.1 Pin Descriptions.

Pin No.	Symbol	Functional
1	LEDA	LED Cathode
2	VLEDK	LED Anode
3	GND	Ground
4	VDD	Power supply(Digital +3.0V)
5~12	R0~R7	Red Data
13~20	G0~G7	Green Data
21~28	B0~B7	Blue Data
29	GND	Ground
30	CLK	Clock
31	DISP	Display on/off
32	HSYNC	Horizontal sync input in RGB mode. (Short to GND if not sued)
33	VSYNC	Vertical sync input in RGB mode. (Short to GND if not sued)
34	DEN	Data Enable
35	NC	NC
36	GND	Ground
37	XR	X_Right
38	YD	Y_Bottom
39	XL	X_Left
40	YU	Y_Up



8.2 Timing Characteristics.

I80-System Interface Timing Characteristics

Normal Write Mode($IOVCC=1.65\sim 3.3V$, $V_{CC}=2.4\sim 3.3V$)

Item	Symbol	Unit	Min.	Typ.	Max.
Bus cycle time	Write	t_{CYCW}	ns	100	
	Read	t_{CYCR}	ns	300	
Write low-level pulse width	PW_{LM}	ns	50		500
Write high-level pulse width	PW_{HW}	ns	50		
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_{WRt}	ns			25
Setup time	Write(RS to nCS, E/nWR)	ns	ns	10	
	Read (RS to nCS, E/nWR)	ns	ns	5	
Address hold time	T_{AH}	ns	5		
Write data set up time	t_{osw}	ns	10		
Write data hold time	t_H	ns	15		
Read data set up time	t_{DDR}	ns			100
Read data hold time	t_{OHR}	ns	5		

Read Timing Characteristics

Reset Timing Characteristics($V_{CC}=1.8\sim 3.3V$, $IOVCC=1.65\sim 3.3V$)

Item	Symbol	Unit	Min.	Typ. .	Max
Reset low-level width	t_{RES}	ms	1		
Reset rise time	t_{RES}	μs			10

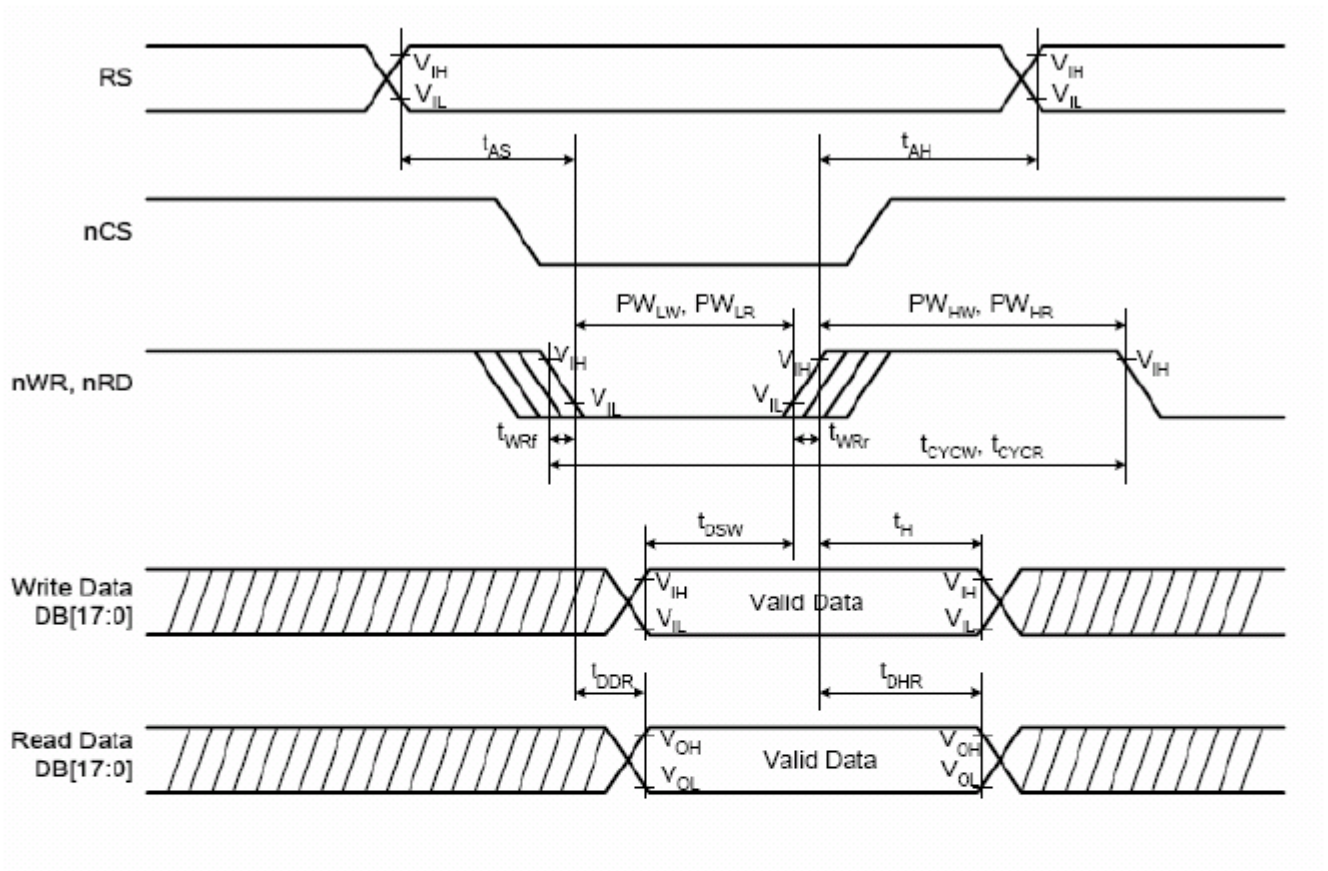
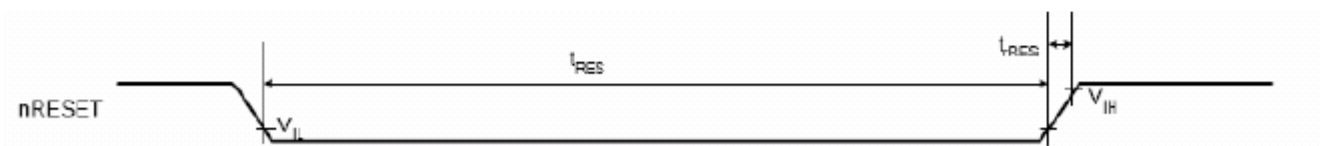


Figure 51 I80-System Bus Timing



Reset Timing

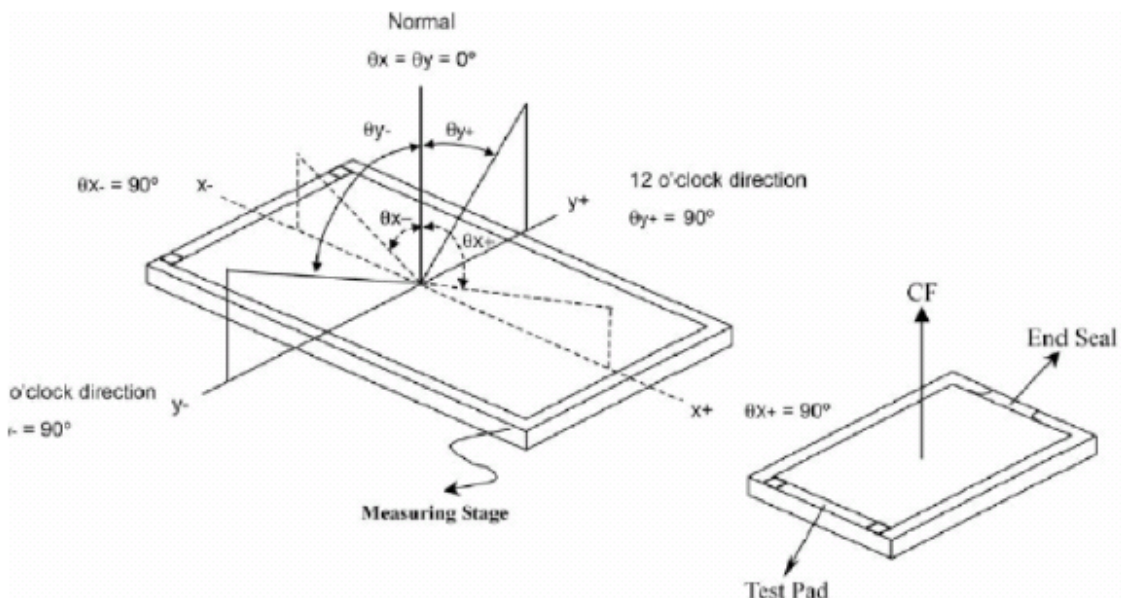


9. Electro-optical Characteristics.

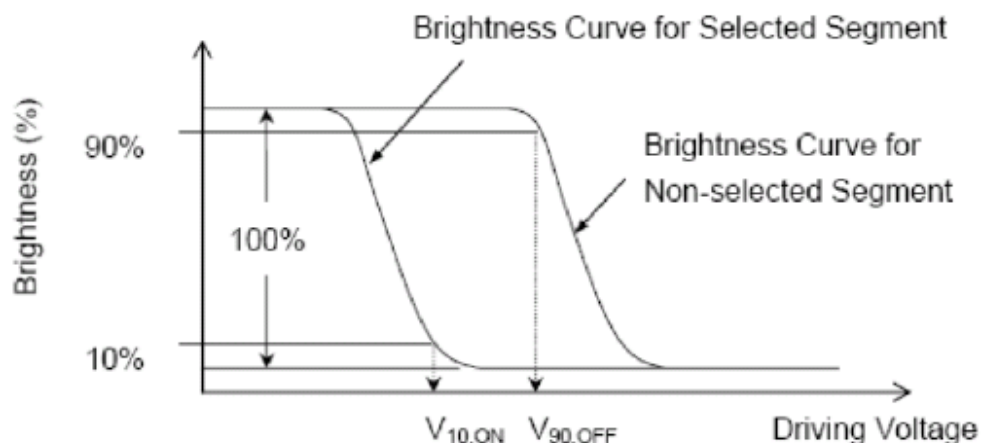
Item	Symbol	Conditions	Temp	Min.	Typ.	Max.	Unit	Note
Response Time	T_R	$\theta = \phi = 0$	25°C		TBD	TBD	msec	NOTE2
	T_F				TBD	TBD		
Viewing Angle Range	$\phi = 0^\circ (6'')$	$\phi = 90^\circ (3'')$	$\phi = 180^\circ (12'')$			$\phi = 270^\circ (9'')$		NOTE3
θ (25°C) $CR \geq 10$	TBD	TBD	TBD			TBD		NOTE3

The above "viewing angle" is the measuring position with the largest contrast ratio. Not for good image quality. Viewing direction for good image quality is 12 O'clock.

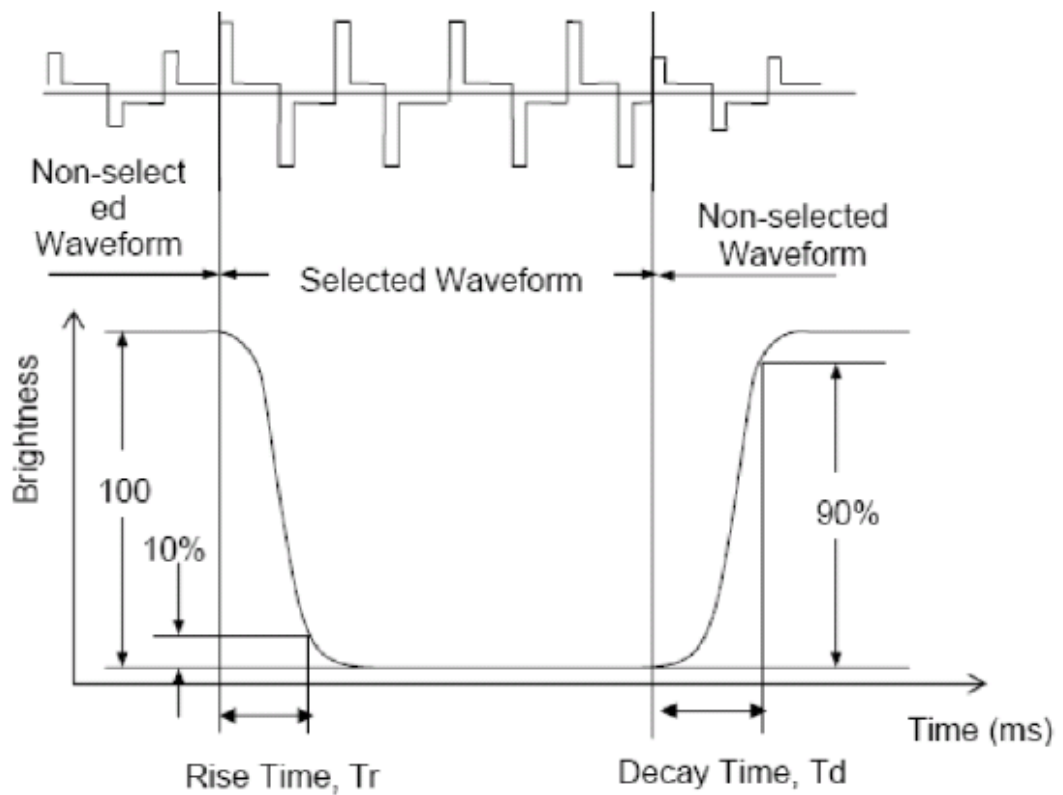
- For panel only
- Electro-Optical Characteristics Test Method



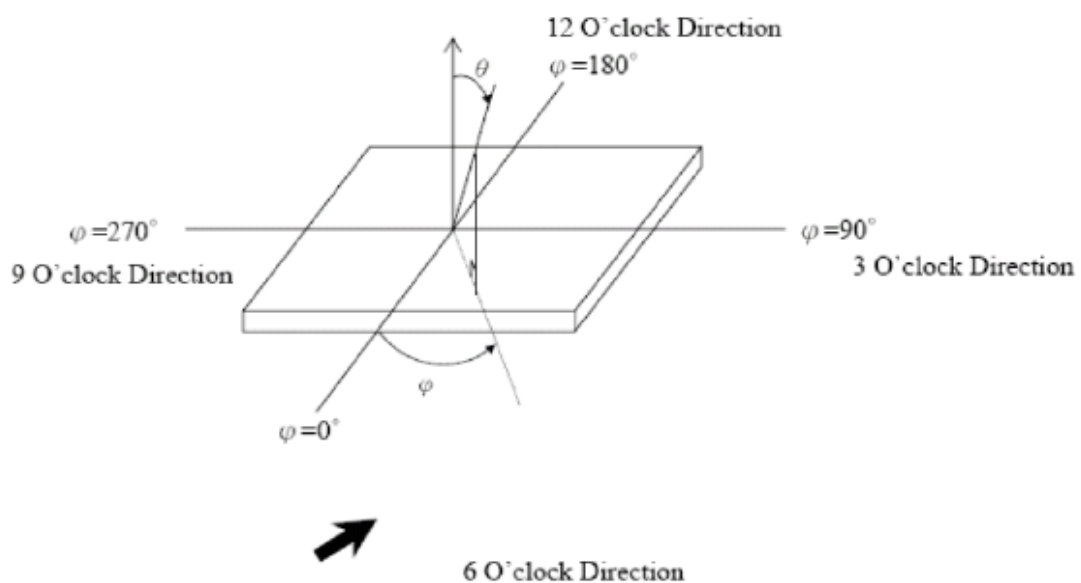
$$V_{op} = (V_{10, ON} + V_{90, OFF})/2$$



Note2.Definition of Optical Response Time:

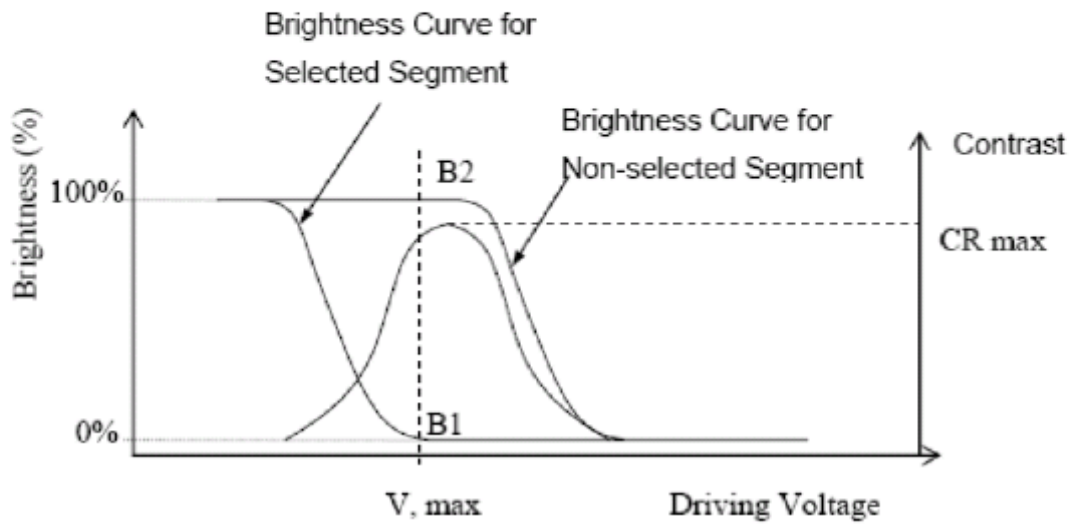


Note3.Definition of Viewing Angle θ and ϕ :



Note4.Definition of Contrast ratio (CR):

$$CR = \frac{\text{Brightness of Non-selected Segment (B2)}}{\text{Brightness of Selected Segment (B1)}}$$



10. Reliability.

10.1 Mtbf

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal

10.2 Test condition

Items	Required Condition	Remark
Temperature Humidity Bias	40□/90%,300Hr	Note 2
High Temperature Operation	85□,300Hr	Note 2
Low Temperature Operation	-30□,300Hr	Note 2
High Temperature Storage	85□,300 hours	Note 2
Low Temperature Storage	-30℃,300 hours	Note 2
Thermal Shock Test	-20℃/30 min ,60℃/30 min ,100cycles	Note 2
Hot Start Test	85℃/1 Hr (min.), power on/off per 5 minutes, repeat 5 times	Note 2
Cold Start Test	-30℃/1 Hr (min.), power on/off per 5 minutes, repeat 5 times	Note 2
Shock Test (Non-Operating)	50G,20ms,Half-sine wave, (±X, ±Y, ±Z)	Note 2
Vibration Test (Non-Operating)	1.5G, 10~200~10Hz, Sine wave, 30mins/axis, 3 direction (X, Y, Z)	Note 2
ESD	Contact Discharge: ±8KV, 150pF(330Ω) 1sec, 8 points, 25 times/point Air Discharge: ±15KV, 150pF(330Ω) 1sec, 8 points, 25 times/point	Note 1,2
Attitude Test	Operating: 14,000 ft, Ramp: 2000 ft/min, 8hrs Non-operating: 40,000 ft, Ramp: 2000 ft/min, 24hrs	Note 2

Note1: According to EN61000-4-2 ESD class B criteria, some performance degradation is allowed. TFT-LCD module is self-recoverable, no data lost and no hardware failures after test.

Note2:

- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module. Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 24 hours at least in advance.

11. Inspection standards.

1.AQL(Acceptable Quality Level)

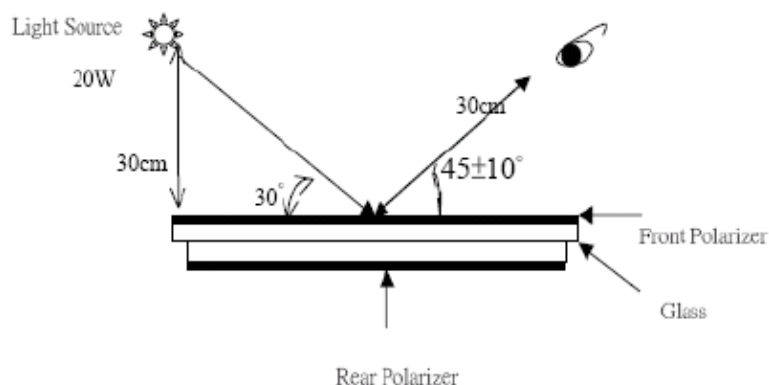
AQL of major and minor defect.

AQL	MAJOR DEFECT	MINOR DEFECT
	0.65	1.5

2. Basic conditions for inspection

The LCM face to us, in normal environment, the lux is 1000 ± 200 . (Darkroom's lux: 100 ± 50), About an angle of incidence 30, a distance of 30 cm with an angle of 45 degree to check the products without uncovering the film!

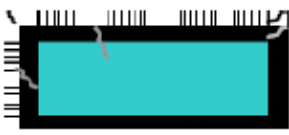
(As shown below)

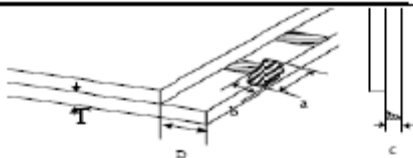
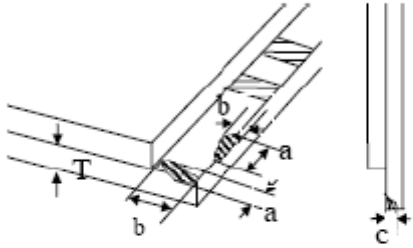
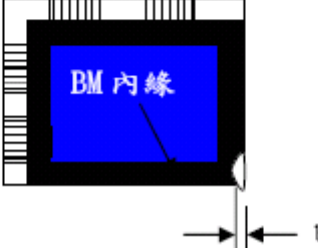


3.Inspection item and criteria

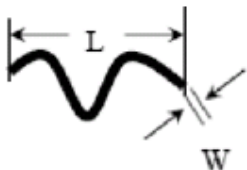
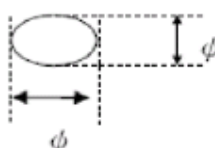
3.1 Visual inspection criterion in immobility

3.1.1Glass defect

NO	Defect item	Criteria	Remark
1	Dimension Unconformity (Major defect)	By Engineering Drawing	
2	Cracks (Major defect)	1. Linear cracks panel 【Reject】 2. Nonlinear crack contrast by limited sample	
3	Glass extrude the conductive area (minor defect)	a: disregards and no influence assemblage. 1) $b \leq 1/3$ Pin width (non bonding area) 【Accept】 2) bonding area ≤ 0.5 mm 【Accept】	A: Length, b: Width
4	Pin-side ,conductive area damaged (minor defect)	(a c: disregards) $b \leq 1/3$ of effective length for bonding electrode 【Accept】	a: length, b: Width, c: Thickness

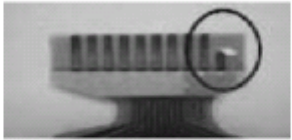
			
5	Pin-side,non-conductive area damaged (minor defect)	1)Damage area don't touch the ITO (Including contraposition mark, except scribing mark) 【Accept】 2) $C < T$ $b \leq BM1/3$ of width 【Accept】 3) $c = T$ b not touch the seal glue 【Accept】 4)a disregards	a: Length, b: Width c: Thickness 
6	Non-pin-side damage (minor defect)	$c < T$ 1)b exceeds $1/3 BM$ 【Reject】 $c = T$ b not touch the seal glue 【Reject】	c: Thickness b: width of  damage

3.1.2 LCD Appearance defect(View area)

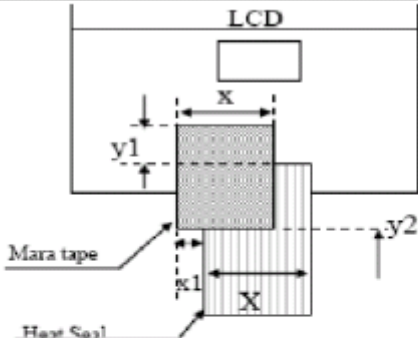
NO	Defect item	Criteria		Remark
1	Fiber, glass cratch, polarizer scratch/folded (minor defect)	Specification	Allowable	note1:L: Length, W: Width note2: disregard if out of AA 
		$W \leq 0.03mm$	disregard	
		$0.03mm < W \leq 0.05mm$; $L \leq 8.0mm$	2	
		$0.05mm < W \leq 0.1mm$; $L \leq 8.0mm$	1	
		$W > 0.1mm$; $L > 3.0mm$	0	
2	Polarizer bubble, concave and convex (minor defect)	$\phi \leq 0.2mm$	disregard	note1: $\phi = (L+W)/2$, L: Length, W: Width note2:disregard if out of AA
		$0.2mm < \phi \leq 0.3mm$	2	
		$0.3mm < \phi \leq 0.5mm$	1	
		$0.5mm < \phi$	0	
3	Black dots, dirty dots, impurities, eye winker (minor defect)	$\phi \leq 0.15mm$	disregard	note2:disregard if out of AA 
		$0.15mm < \phi \leq 0.25mm$	2	
		$0.25mm < \phi \leq 0.3mm$	1	
		$0.3mm < \phi$	0	

4	Polarizer prick (minor defect)	$\phi \leq 0.1\text{mm}$	disregard	note1: $\phi = (L+W)/2$, L=Length, W=Width note2: the distance between two dots $\geq 5\text{mm}$
		$0.1\text{mm} < \phi \leq 0.25\text{mm}$	3	
		$\phi > 0.25\text{mm}$	0	

3.1.3 FPC

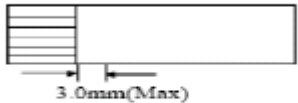
NO	Defect item	Criteria		Remark
1	Copper screen peel (minor defect)	Copper screen peel 【Reject】		
2	No release tape or peel	No release tape or peel 【Reject】		
3	Dirty dot and impurity of FPC for customer using side (minor defect)	Specification	Allowable	Note1: Cannot have stride ITO impurities
		$\phi \leq 0.25\text{mm}$	2	
		$\phi > 0.25$	0	

3.1.4 Black tape & Mara tape

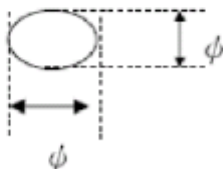
NO	Defect item	Criteria	Remark
1	FPC or H/S black tape (minor defect)	1. shift spec: 1) glue to the polarize 【Reject】 2) IC bare 【Reject】 2. left-and-right spec: 1) exceed of FPC edge or H-S edge 【Reject】 2) IC bare 【Reject】	
2	No black tape (major defect)	No black tape 【Reject】	
3	Tape position mistake (minor defect)	Not by engineering drawing	
4	Mara tape defect (minor defect)	Peel before pulling the protecting film 【Reject】	

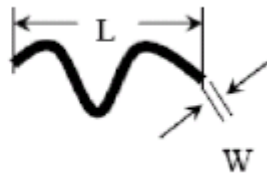
3.1.5 Silicon and taffy glue

NO	Defect item	Criteria	Remark
1	Quantity of silicon (major defect)	Uncover the ITO and circuit area 【Reject】	note: compared by engineering
2	Taffy glue (major defect)	1. Uncover the reveal copper area 【Reject】 2. Cover layer 0.3mm(Min)~3.0mm(Max)	note: if customer has special requirement, refer to the technical

		【Reject】	document 
3	Depth of glue covering (major defect)	Depth of glue covering ovetop front Polarizer 【Reject】	Except of the special requirement

3.2 Electrical criteria

NO	Defect item	Criteria	Remark	
1	No display (major defect)	No display 【Reject】		
2	Missing line (major defect)	Missing line 【Reject】		
3	Seg-com light and dark (major defect)	Seg-com light and dark 【Reject】	ND filter 2% test	
4	No display in immobility (major defect)	No display in immobility 【Reject】		
5	Flicker of Pattern (major defect)	Flicker of Pattern 【Reject】		
6	Mura (major defect)	ND filter 2% test		
7	Over current (major defect)	Over current 【Reject】		
8	Voltage out of specification (major defect)	Voltage out of specification 【Reject】		
9	Pattern blur, error code (major defect)	Pattern blur, error code 【Reject】		
10	Dark light, Flicker (major defect)	Dark light, Flicker 【Reject】		
11	Black/white dots 、 Dirty dots、 eye winker (major defect)	Specification	Allowable	Note1: disregard if out of AA 
		$\phi \leq 0.15\text{mm}$	disregard	
		$0.15\text{mm} < \phi \leq 0.25\text{mm}$	2	
		$0.25\text{mm} < \phi \leq 0.3\text{mm}$	1	
		$0.3\text{mm} < \phi$	0	
12	Fiber、glass crutch、Polarizer scratch/folded (major defect)	$W \leq 0.03\text{mm}$	disregard	Note1: L: Length, W: Width Note2: disregard if out of AA
		$0.03\text{mm} < W \leq 0.05\text{mm}$ $L \leq 3.0\text{mm}$	2	
		$0.05\text{mm} < W \leq 0.1\text{mm}$ $L \leq 3.0\text{mm}$	1	

		$W > 0.1\text{mm}; L > 3.0\text{mm}$	0	
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12. Precautions for using LCD modules.

12.1 Safety

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

12.2 Storage Conditions

- (4) Store the panel or module in a dark place where the temperature is $23 \pm 5^\circ\text{C}$ and the humidity is below $45 \pm 20\%\text{RH}$.
- (5) Store in anti-static electricity container.
- (6) Store in clean environment, free from dust, active gas, and solvent.
- (7) Do not place the module near organic solvents or corrosive gases.
- (8) Do not crush, shake, or jolt the module.

12.3 Handling Precautions

- (9) Avoid static electricity, which can damage the CMOS LSI.
- (10) The polarizing plate of the display is very fragile, please handle it very carefully.
- (11) Do not give external shock.
- (12) Do not apply excessive force on the surface.
- (13) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (14) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (15) Do not operate it above the absolute maximum rating.
- (16) Do not remove the panel or frame from the module.

12.4 Warranty

The period is within twelve months since the date of shipping out under normal using and storage conditions.

13. Revision History.

Version	Revise record	Date
00	Original version	13-12-04



SAMPLE APPROVED REPORT
(样品确认单)

SAMPLE MODEL NO. (样品型号)	JH70800480A
SAMPLE SERIES NUMBER NO. (样品序号)	---
SAMPLE QUANTITY (样品数量)	---
COLOR/TYPE (底色/类型)	TFT/NEGATIVE
VIEWING DIRECTION (视角)	6:00
DRIVING METHOD (驱动参数)	1/480DUTY
LOGIC VOLTAGE (工作电压)	3.3V
LCD VOP (LCD 驱动电压)	-
OPERATING TEMP. (操作温度) °C	-10~70°C
STORAGE TEMP. (储存温度) °C	-20~70°C
POLARIZER----FRONT (首偏光片)	TRANSMISSIVE
POLARIZER----BACK (后偏光片)	---
CONTROLLER/DRIVER IC(控制/驱动 IC)	OTA7001A_V03
BACKLIGHT COLOR/TYPE (背光源类型/颜色)	LED/WHITE
BACKLIGHT VOLTAGE (背光电压)	-
SPECIFICATION (规格书 份数)	1BATE
REMARKS: (备注)	
WRIT BY: _____ DATE: _____ APROV BY: _____ DATE: _____	
CUSTOMER'S APPROVAL (客户确认):	
1) FUNCTION (功能): ☐ OK ☐ N.G.	
2) DRIVER CONDITION (驱动条件): ☐ OK ☐ N.G.	
3) DISPLAY MODE (显示模式): ☐ OK ☐ N.G.	
4) VIEWING ANGLE (视角): ☐ OK ☐ N.G.	
5) BACKLIGHT (背光源): ☐ OK ☐ N.G.	
6) DISPLAYING PATTERN (显示效果): ☐ OK ☐ N.G.	
CUSTOMER'S CONCLUSIONS (客户意见): _____	

CUSTOMER'S SIGNATURE (客户签名): _____ DATE (日期): _____	