Specification for Mono LCD Display module

320 x 240 Monochrome LCD Display module

Manufacturer	Yes Optoelectronics Co., Ltd
Part n°	YMS320240-05BFNBDSL
Ordering n°	YMS320240-05BFNBDSL
Customer Part n°	n/a
Revision n°	1.0
Issue Date	2014/08/15

Customer's Approval

Company name	
Printed name	
Job title	
Signature	
Approval Stage:	This product is approved for the following production stage: - ☐ Sample / Prototype ☐ Pre-Production ☐ Mass Production
Approval Date	

Supplied by Anders Electronics plc
Manufactured by Yes Optoelectronics Co., Ltd

anders electronics plc | Kings Studios, 43-45 Kings Terrace, London, NW1 0JR | Tel: +44(0)20 7388 7171| Fax: +44(0)20 7383 2423 | www.andersDX.com | info@andersDX.com

ANSHAN YES OPTOELECTRONICS DISPLAY CO.,LTD

SPECIFICATIONS FOR
LIQUID CRYSTAL DISPLAY MODULE

MODEL NO.: YMS320240-05BFNBDSL DATE:AUG.15,2014

Approved	Checked	Department

CUSTOMER:

MODEL NO.: DATE:

Approved	Checked	Department

ADD: 215# QIANSHAN ROAD,ANSHAN LIAONING P.R.CHINA

TEL: 86-412-5212122 FAX: 86-412-5211729 P.C.:114044

E-mail : santlcd @ mail.asptt.ln.cn , sante @ asiansources.com

LIST

Ⅰ.General Specifications

1.The Features :

(1). Low power consumption 5.0V power supply

(2). 1/240 duty,1/13 bias

(3). Viewing direction: 6:00

(4). Operating tempration: -20~70℃

(5). Storage tempration: -30~85℃

(6). Display type: STN-BLUE , Negative

2.Mechanical Data and Conditions:

(1) Number of Characters---------- 320 Dots * 240 Dots

(2) Module Size----------160.0 w * 109.0 h mm

(3) Viewing Area ---------- 122.0 w * 92.0 h mm

(4) Dot Size ----------0.34 w * 0.34 h mm

(5) Dot Pitch ----------0.36w * 0.36 h mm

(6) Outline Dimensions----------See Attached Drawing

3. Absolute Maximum Ratings

Characteristics	Symbol	Ratings
Power Supply Voltage	VDD	-0.3V to +7.0V
Driver supply voltage	VLCD	0V to +30V
Input Voltage	V_{IN}	-0.3V to Vdd+0.3V

4.Pin Connections:

CN1/CN2/CN4:

Pin No.	Symbol	Function
1-4	DB0-DB3	Data Bit
5	/DISPOFF	H: Display on L: Display off
6	FRAME	Indicates the beginning of each display cycle
7	NC	No signal
8	LOAD	Data latch pulse
9	CP	Data shift clock pulse
10	Vdd	Supply Voltage for Logic and LCD(+)
11	Vss	Ground
12	Vee	Supply voltage for LCD(-)
13	V0	Operating voltage for LCD (variable)
14	FGND	Frame ground
15	A	LED BACKLIGHT
16	K	LED BACKLIGHT

5. AC CHARACTERISTICS

(1) Segment Driver Application

(V_{SS} = 0V, Ta = - 30 ~ +85°C)

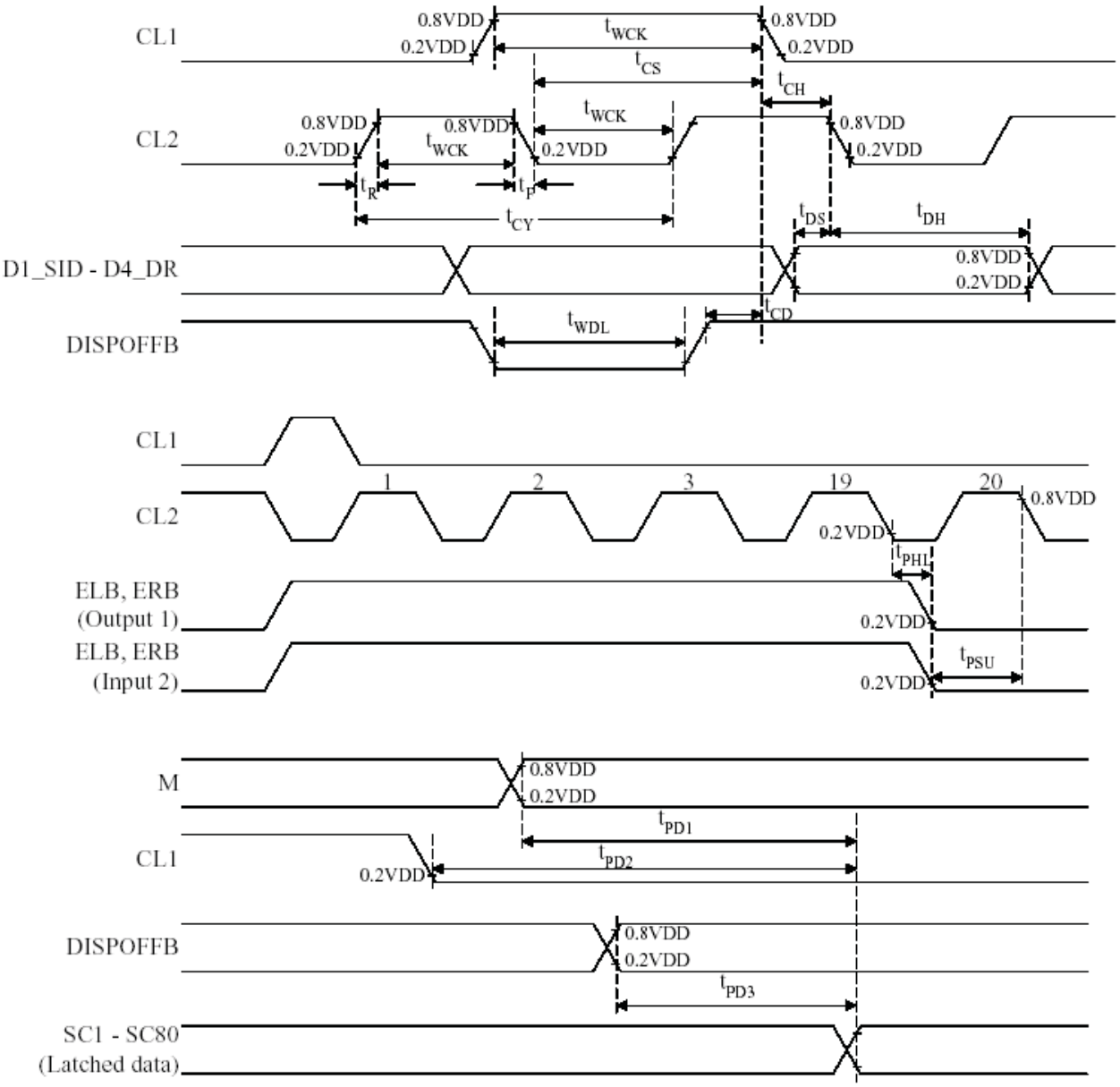
Characteristic	Symbol	Test condition	(1) VDD=5V±10%			(2) VDD=3V±10%			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Clock cycle time	t_{CY}	Duty=50%	125	-	-	250	-	-	ns
Clock pulse width	t_{WCK}	-	45	-	-	95	-	-	
Clock rise/ fall time	t_R / t_F	-	-	-	-	-	-	30	
Data set-up time	t_{DS}	-	30	-		65	-	-	
Data hold time	t_{DH}	-	30	-		65	-	-	
Clock set-up time	t_{CS}	-	80	-		120	-	-	
Clock hold time	t_{CH}	-	80	-		120	-	-	
Propagation delay time	t_{PHL}	ELB output	-	-	60	-	-	125	
		ERB output			60			125	
ELB,ERB set-up time	t_{PSU}	ELB input	30	-	-	65	-	-	
		ERB input	30			65			
DISPOFFB low pulse width	t_{WDL}	-	1.2	-	-	1.2	-	-	μs
DISPOFFB clear time	t_{CD}	-	100	-	-	100	-	-	ns
M – OUT propagation delay time	t_{PD1}	C_L=15pF	-	-	1.0	-	-	1.2	μs
CL1 – OUT propagation delay time	t_{PD2}		-	-	1.0	-	-	1.2	
DISPOFFB – OUT propagation delay time	t_{PD3}		-	-	1.0	-	-	-	

(2). Common Driver Application

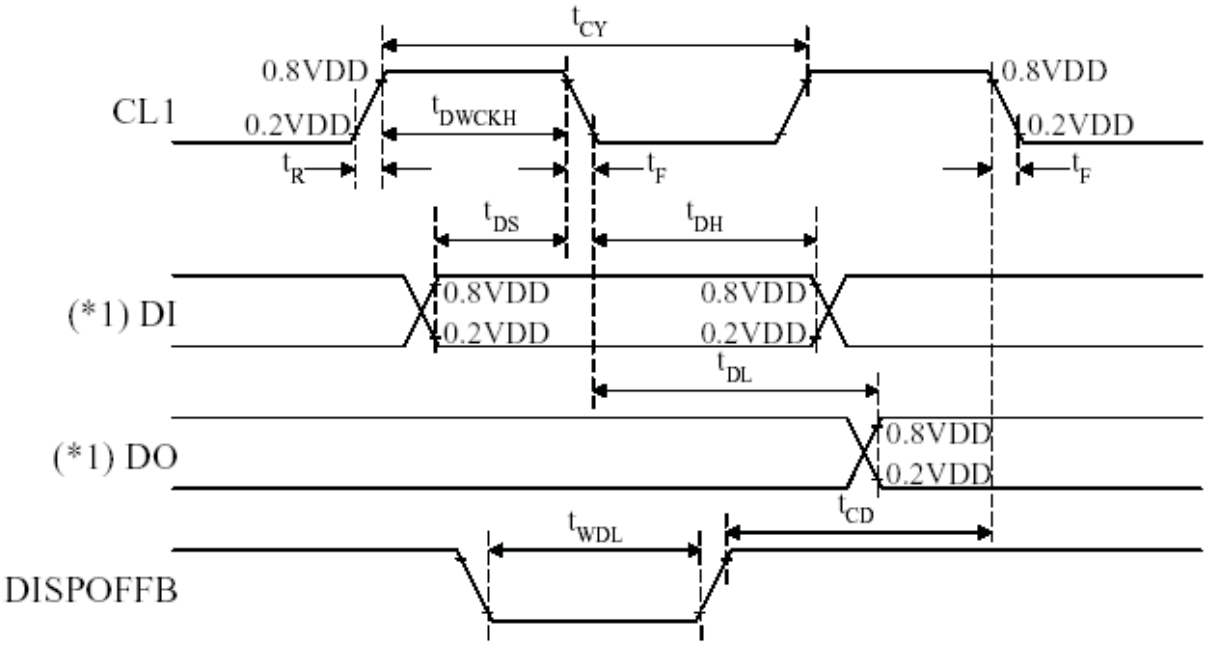
(V_{SS} = 0 V, Ta = - 30 ~ +85° C)

Characteristic	Symbol	Test condition	(1) VDD=5V±10%			(2) VDD=3V±10%			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Clock cycle time	t_{CY}	Duty=50%	250	-	-	500	-	-	ns
Clock pulse width	t_{WCK}	-	45	-	-	95	-	-	
Clock rise/ fall time	t_R / t_F	-	-	-	50	-	-	50	
Data set-up time	t_{DS}	-	30	-		65	-	-	
Data hold time	T_{DH}	-	30	-		65	-	-	
DISPOFFB low pulse width	t_{WDL}	-	1.2	-	-	1.2	-	-	μs
DISPOFFB clear time	t_{CD}	-	100	-	-	100	-	-	ns
Output delay time	t_{DL}	C_L=15pF	-	-	200	-	-	250	
M – OUT propagation delay time	t_{PD1}		-	-	1.0	-	-	1.2	μs
CL1 – OUT propagation delay time	t_{PD2}		-	-	1.0	-	-	1.2	
DISPOFFB – OUT propagation delay time	t_{PD3}		-	-	1.0	-	-	1.2	

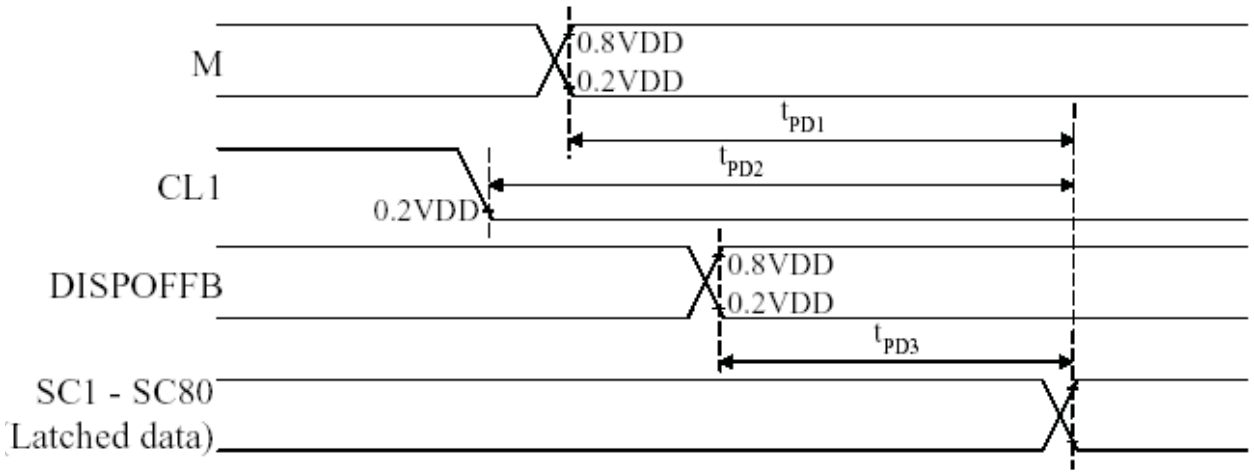
(3) Segment Driver Application Timing



(4). Common Driver Application Timing



(*1) When in single-type interface mode
DI=>DDL(SHL=L), D4_DR(SHL=H)
DO=>D4_DR(SHL=L), D2_DL(SHL=H)
When in dual-type interface mode
DI=>D2_DL and D3_DM(SHL=L),D4_DR and D3_DM(SHL=H)
DO=>D4_DR(SHL=L), D2_DL(SHL=H)



Ⅱ.The Characteristics and Reliability Test

1.Electro-Optic Characteristics

Condition:TEMP=(23±3)℃

NO	Item		Symbol	Min.	Typ.	Max.	Unit	Condition
1	Supply Voltage(Logic)		Vdd-Vss	4.5	5.0	5.5	V	
2	LCD Operating Voltage		Vdd-V_0		22.4		V	-20℃
					22.0		V	25℃
					21.6		V	70℃
3	Response Time		Ton		187		ms	
			Toff		245		ms	
4	Contrast		CR	2				
5	Viewing Angel	12H	θ 1		50		Deg.	(CR≥2.0)
		6H	θ 2		62			
		3H	θ 3		55			
		9H	θ 4		55			
6	Current Consumption		Is	36.0		52.2	mA	

2. Characteristics of backlight (LED unit)

(1). Absolute Maximum Ratings:

Item	Symbol	Rat.	Unit	Condition
Forward Current	IFM	200	mA	Ta=25℃
Reverse Voltage	VR	1.0	V	Ta=25℃
Power Dissipation	PD	600	mW	Ta=25℃

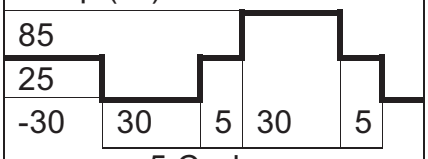
(2). Electrical-optical Characteristics:

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward Current	IF	80	120	160	mA	VF=5V
Reverse current	IR		30		mA	VR=0.8V
Luminous	LV	180	190	270	cd/m^2	VF=5V
Color	WHITE					

WARNING:

A BACKLIGHT IS A KIND OF CURRENT DEVICE,IT MUST CONNECT A RESISTANCE FOR LIMITING CURRENT ,OR IT WILL BE DAMAGED.

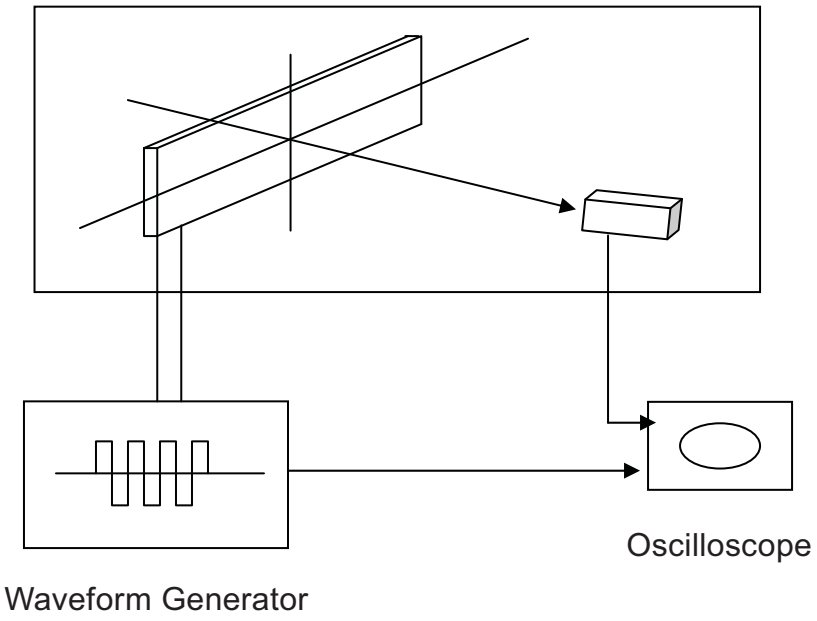
3.Reliability Test

No	Items	Test Condition	Equipment	Test Result
1	High Temp Storage	Temp:85±2℃ Time:96h Restore:24h	Tenny	Passed
2	Low Temp Storage	Temp:-30±3℃ Time:96h Restore:24h	Tenny	Passed
3	High Temp Static drive	Temp:70±2℃ Vop:5V Time:24h Restore:24h	Tenny	Passed
4	Low Temp Static drive	Temp:-20±3℃ Vop:5V Time:24h Restore:24h	Tenny	Passed
5	High Temp High Hum Storage	Temp:40±2℃ Hum:95%Rh Time:96h Restore:24h	Tenny	Passed
6	Thermal Shock	Temp:(℃)  5 Cycles Restore:24h	Tenny	Passed

LOW FREQUENCY VIBRATION	Frequency: 10~60hz, Constant amplitude: 1.5mm Directions: x-, y-, z- axis Duration: 2 hour each axis Linear sweeping: 10~60~10hz/5min

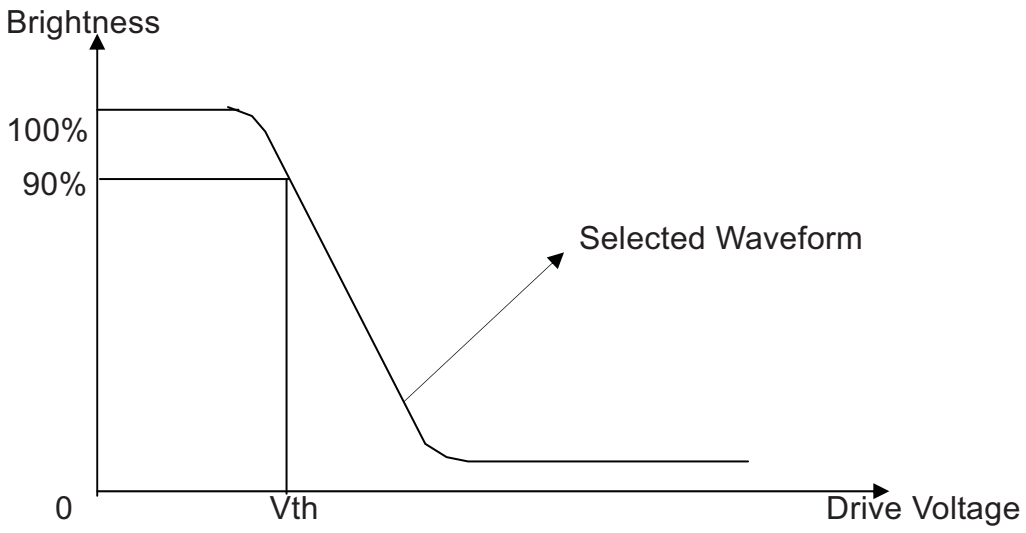
Ⅲ.The Equipment and LCD Measuring Method

1. Equipment

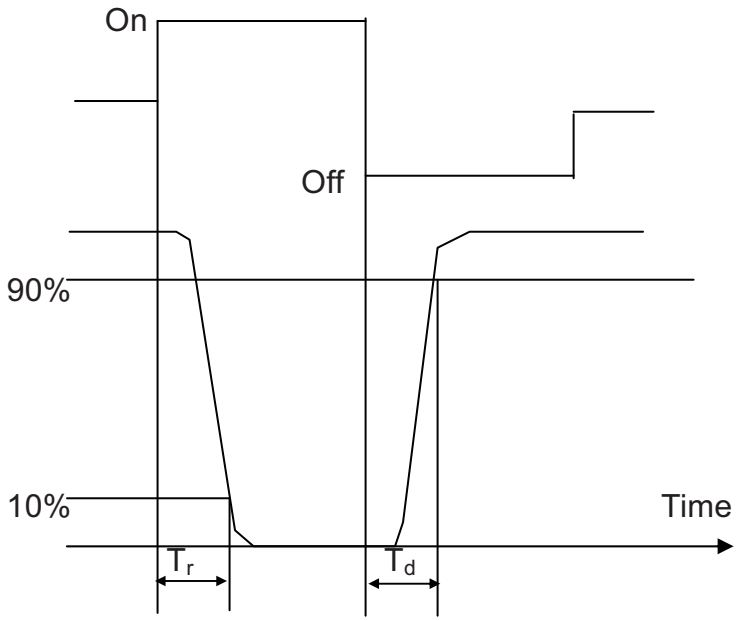


2. Definition

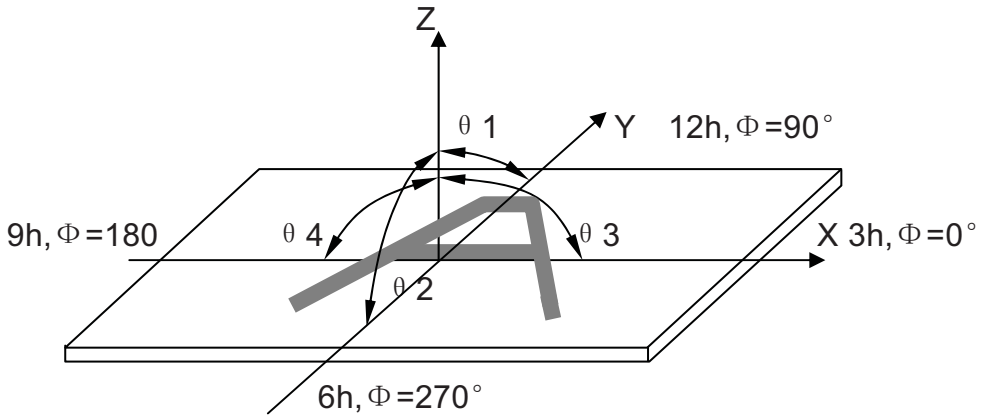
(1). Threshold Voltage (Vth)



(2). Response Time



(3).Viewing Angle:



(4).Contrast Ratio (Positive)

$$CR = \frac{\text{Brightness of non-selected wave-form}}{\text{Brightness of selected wave-form}}$$

3. Reliability Test:

Equipment : TENNY

Ⅳ.Standard Specifications for Product Quality

1. Manner of Test:：

1.1.The Test Must Be Under 40w Flourescent Light, And The Distance Of View Must Be At 30cm.

1.2.The Test Direction Is Based On Around 15° - 45° Of Vertical Line.

2. Definition Of Defects

2.1 Major Defects

A:Non-Display

B:Segment Missing

C:Over Current

D:Segment Short

E:Sealant Dishardexn

F:Wrong Polarizer Direction

2.2minor Defects: The Others.

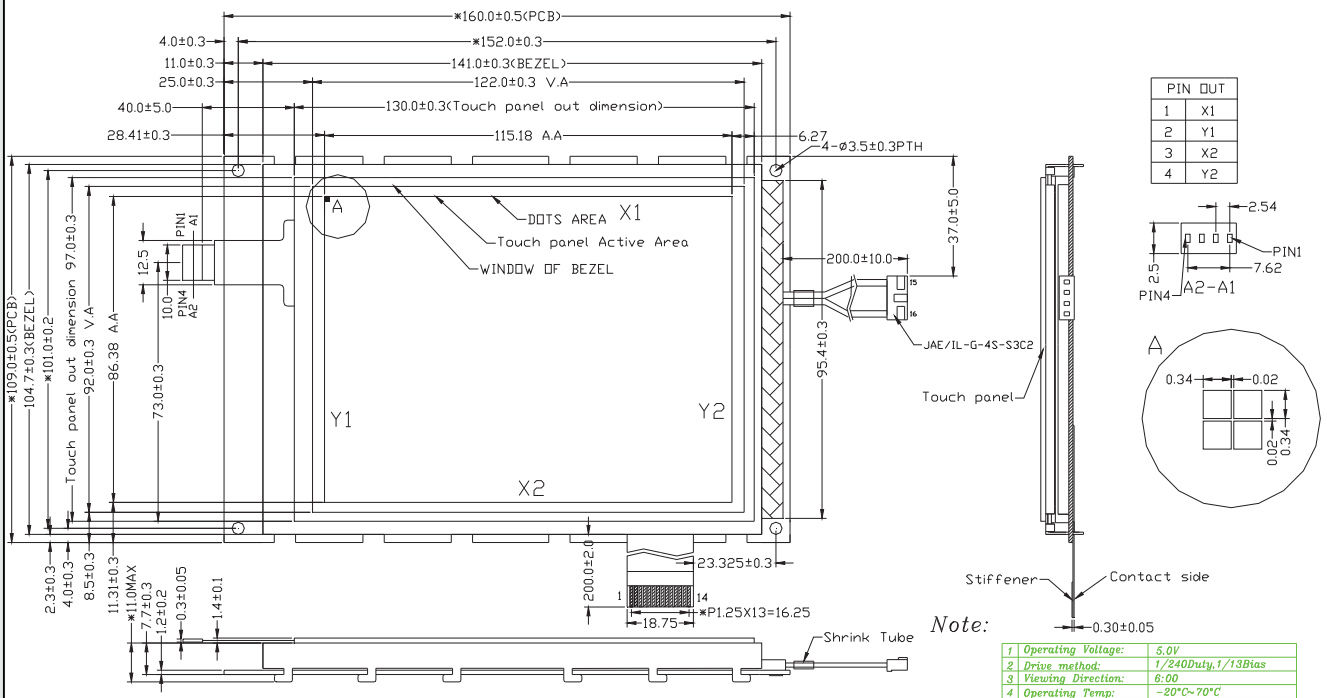
3.Major Defects Should Be In AQL 0.25,and The Minor In AQL 1.00

4.Inspection Item and Standards

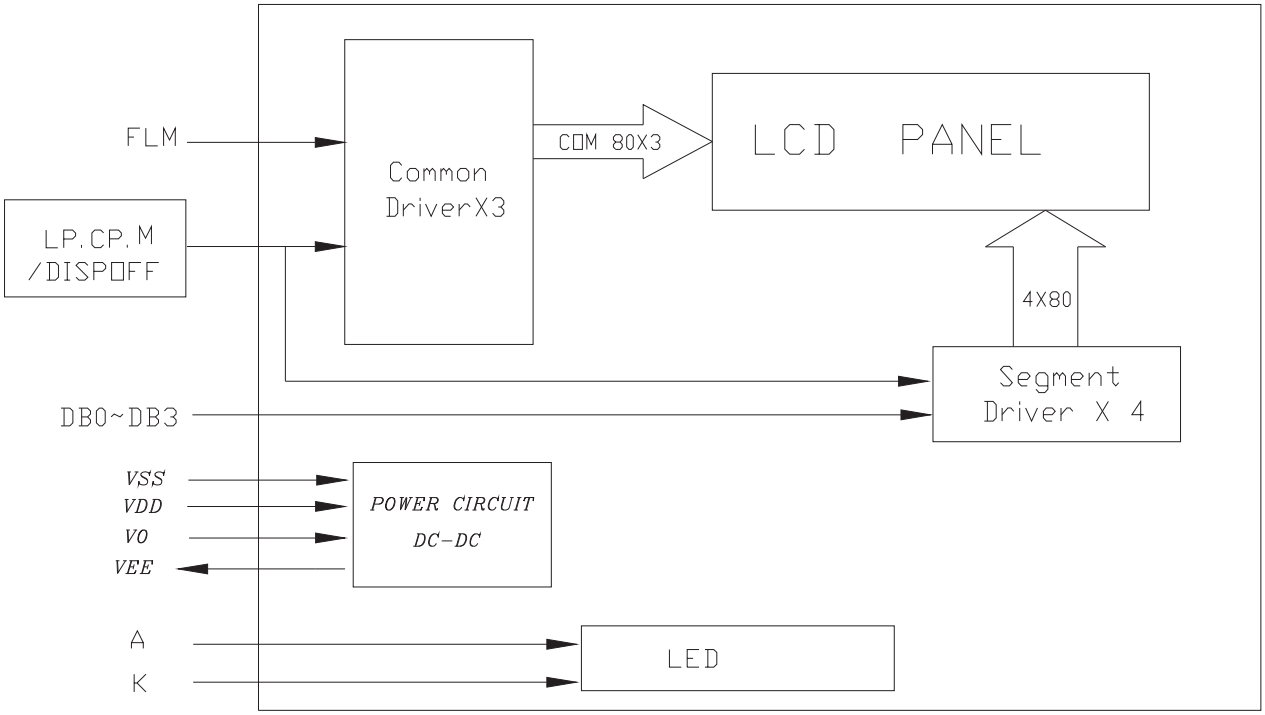
Item	The Standard Of Quality Inspection	Checking Manner	Quality Ratio
Frame	Smooth and even surface,no crack,no scratch,no rusty,and not be wrenched out of shape.the range between convex and concave is:d≤0.35mm,and the frame must be connected to the ground.	Checking With Eyes And Using Vernier Caliper, Multimeter	100%
LCD	The major defects would be reject.no scratch and no dusty on the LCD glass surface.d≤0.15mm n≤2 diameter of bubble:d≤0.5 n≤2 damaged size of polarizer:d≤0.15mm, n≤2.	Check It When Displaying	100%
The Relative Position of LCD and Frame	The sealant mouth of the LCD must be at the same side with the frame's.	Checking With Eyes	100%
The Relative Position of PCB Paneland Frame	The frame installing direction must be correct.the twisted angle of the pin is from 45° to 60°,the pin is vertical to PCB panel and it must be in the middle position of the installing holes.	Checking With Eyes	100%
Function Test	1. The major defects must be reject. 2. Test flow chart (see attached chart) 3. Background changes evenly and no disorderly displaying phenomenon. 4. Display no shortage.	Check It When Displaying	100%

Note:D～Diameter N～Quantity Unit:mm

Ⅴ. Attach Drawing



1	Operating Voltage:	5.0V
2	Drive method:	1/240Duty,1/13Bias
3	Viewing Direction:	6:00
4	Operating Temp:	-20°C~70°C
5	Storage Temp:	-30°C~85°C
6	Display type:	STN-BLUE,Negative,T/T
7	Unspecified tolerance:	±0.2
8	LCD controller/driver:	NT7086PQ
9	Backlight:	LED/W
10	Customer No.:	
11	Dimensions with mark"*"are important	
12	RoHS compliant	



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SYMBOL	DB0	DB1	DB2	DB3	/DISPOFF	FRAME	NC	LOAD	CP	Vdd	Vss	Vee	V0	FGND	A	K