Specification for Mono LCD Display module

128 x 64 STN Monochrome Display module

Manufacturer	Yes Optoelectronics Co., Ltd
Part n°	YMS12864-04AHAYDCL
Ordering n°	YMS12864-04AHAYDCL
Customer Part n°	n/a
Revision n°	1.2
Issue Date	2013/10/26

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.: YMS12864-04AHAYDCL DATE: OCT.26.2013

Approved	Checked	Department

CUSTOMER: ORTEK

MODEL NO.: DATE:

Approved	Checked	Department

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

TEL: 86-412-5211859 FAX: 86-412-5211729 P.C.:114044

E-mail : yes@yes-lcd.com, yeslcd@globalsources.com

Web: http://www.yes-lcd.com

http://www.asiansources.com/sante.com

REVISION HISTORY

Rev.	Date	Item	Page	Content
1.0	OCT.10.2013	New Creation	ALL	
1.1	OCT.16.2013	Add the label on the bottom side	19-20	
1.2	OCT.26.2013	Modify the IC label	19-20	

LIST

I. General Specifications

1. Features

A. Drive Method:1/64 Duty, 1/9 Bias

B. The Module Operating Voltage:5.0V;

C. Display mode: STN mode, Transfletive, positive type display

D. The LCD Operating Voltage :9.7V;

E. Viewing Direction: 6:00

F. Operating Temperature: -20℃~70℃

G. Storage Temperature: -30℃~80℃

2.Mechanical Data:

(1) Module Size ---------- 75.0 w * 52.7 h mm

(2) Viewing Area ---------- 60.5 w * 33.0 h mm

(3) Dot Size ---------- 0.40 w * 0.40 h mm

(4) Number of Dots ----------128 * 64 Dots

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

3.Absolute Maximum Ratings

Characteristic	Symbol	Value	Unit	Note
Operating voltage	V_{DD}	-0.3 to +7.0	V	(1)
Supply voltage	V_{EE}	V_{DD}-19.0 to VDD+0.3		(4)
Driver supply voltage	V_B	-0.3 to V_{DD}+0.3		(1),(2)
	V_{LCD}	V_{EE}-0.3 to V_{DD}+0.3		(3),(4)

NOTES:

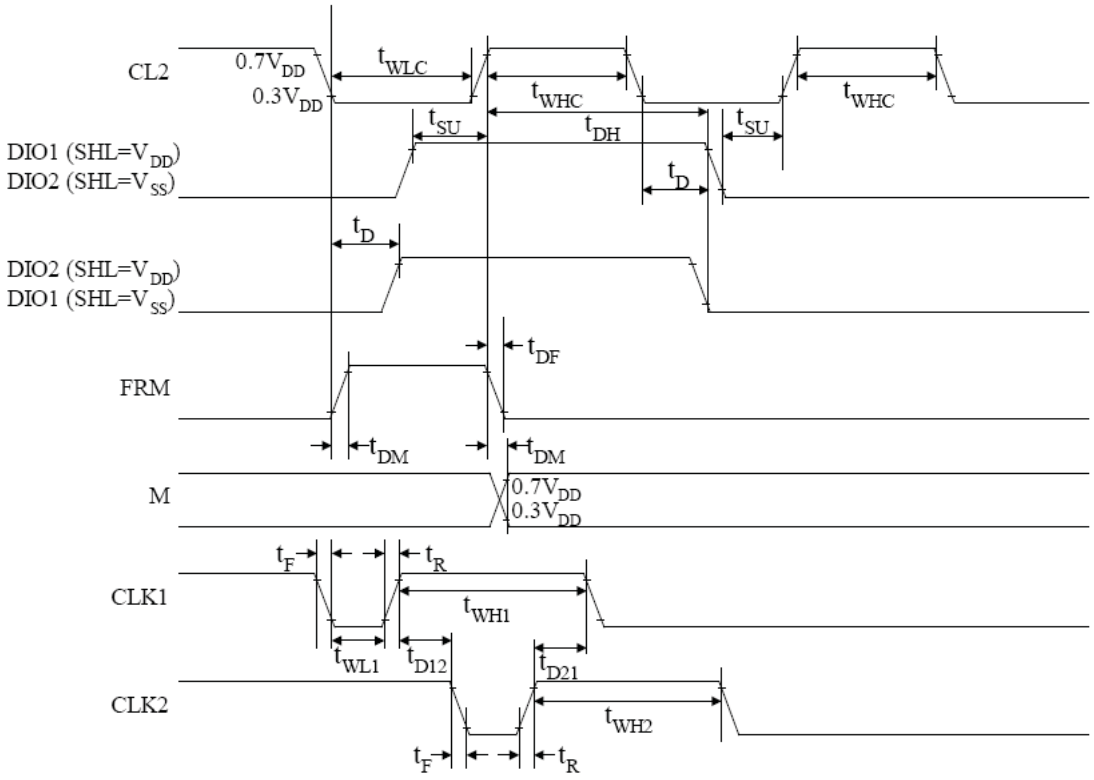
1. Based on Vss=0V
2. Applies to input terminals and I/O terminals at high impedance. (Except V0L(R), V1L(R), V4L(R) and V5L(R))
3. Applies to V0L(R), V1L(R), V4L(R) and V5L(R).
4. Voltage level: $V_{DD} \geqq$ V0L=V0R $\geqq$ V1L=V1R $\geqq$ V4L=V4R $\geqq$ V5L=V5R $\geqq V_{EE}$.

4.Pin Connections:

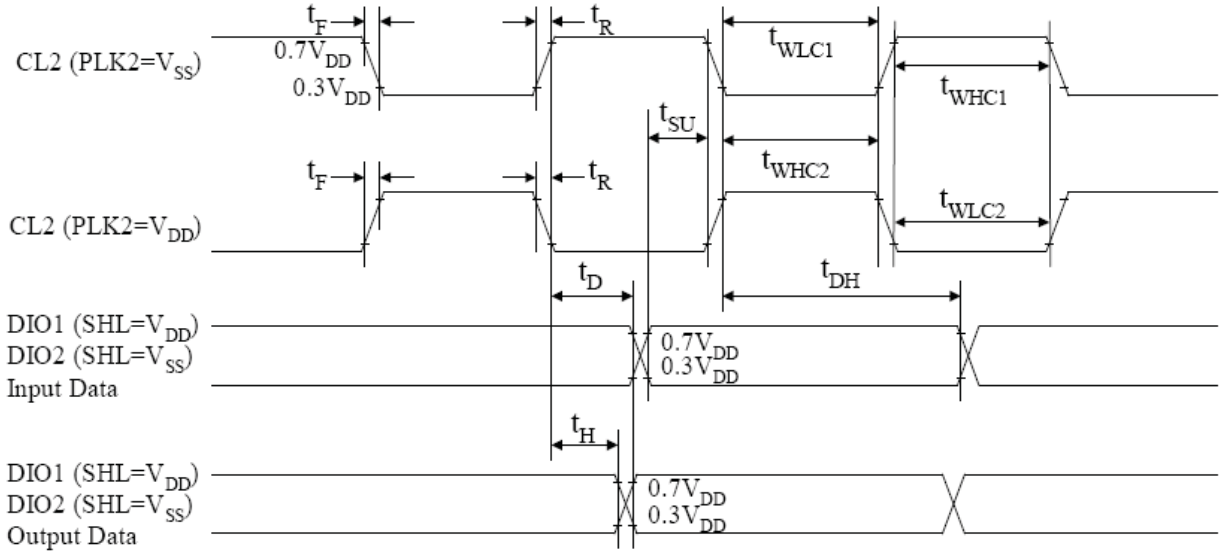
Pin No.	Symbol	Function
1	VSS	Ground(0v)
2	VDD	Logic Supply Voltage(+5.0V)
3	VEE	LCD Driver Voltage Input(+9.7V)
4	RS	Data Or Instruction
5	R/W	Read/Write Select
6	E	Enable Signal
7~14	DB0~DB7	Data Bus Line
15	CS1	Chip Selection(Segment Driver 1)
16	CS2	Chip Selection(Segment Driver 2)
17	RSTB	Reset Signal
18	Vout	Dc-Dc-Converter Output
19	LED +	LED Backlight anode
20	LED-	LED Backlight cathode

5.AC Characteristics:(VDD=5V±10%)

Master Mode (MS=V_{DD}, PCLK2=V_{DD})

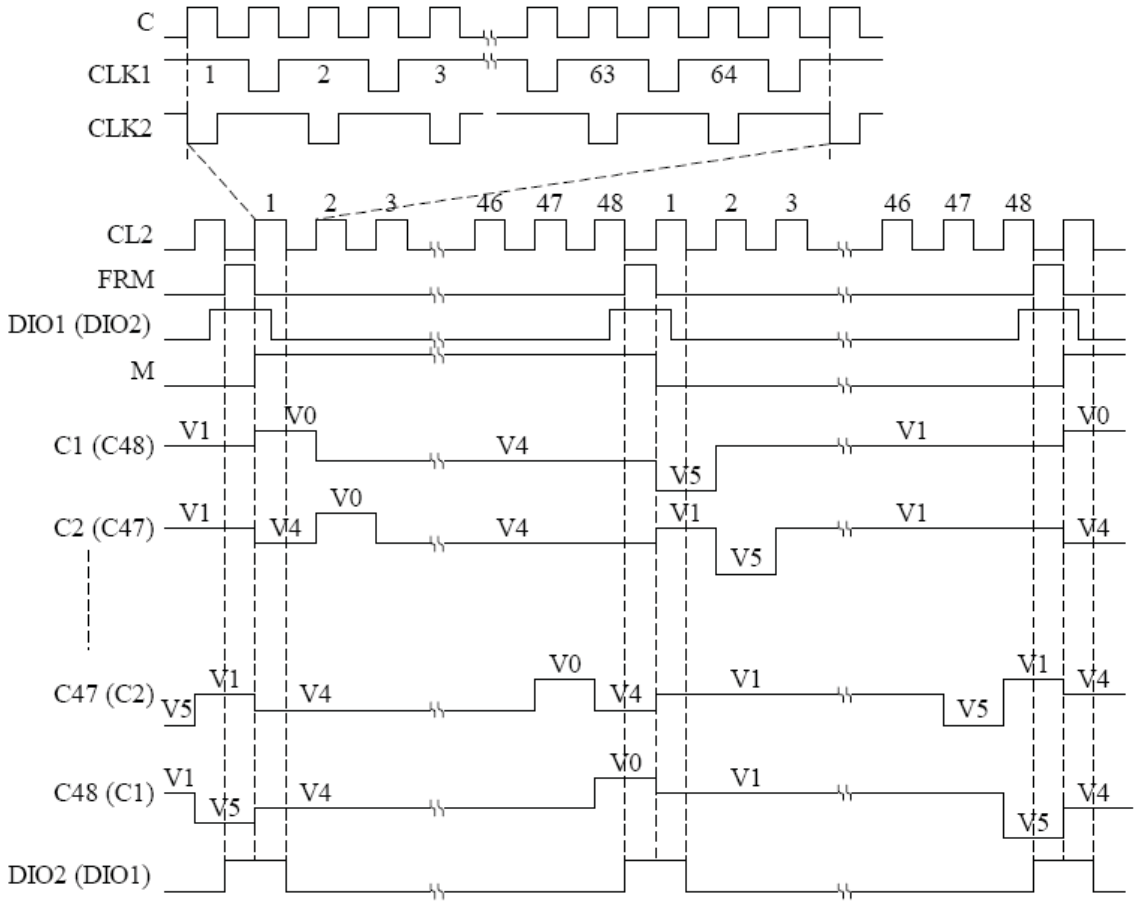


Slave Mode (MS=V_{SS})

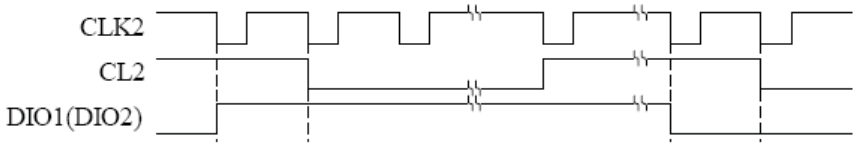


1/48 DUTY TIMING (MASTER MODE)

Condition: DS1=L, DS2=L, SHL=H (L), PCLK2=H

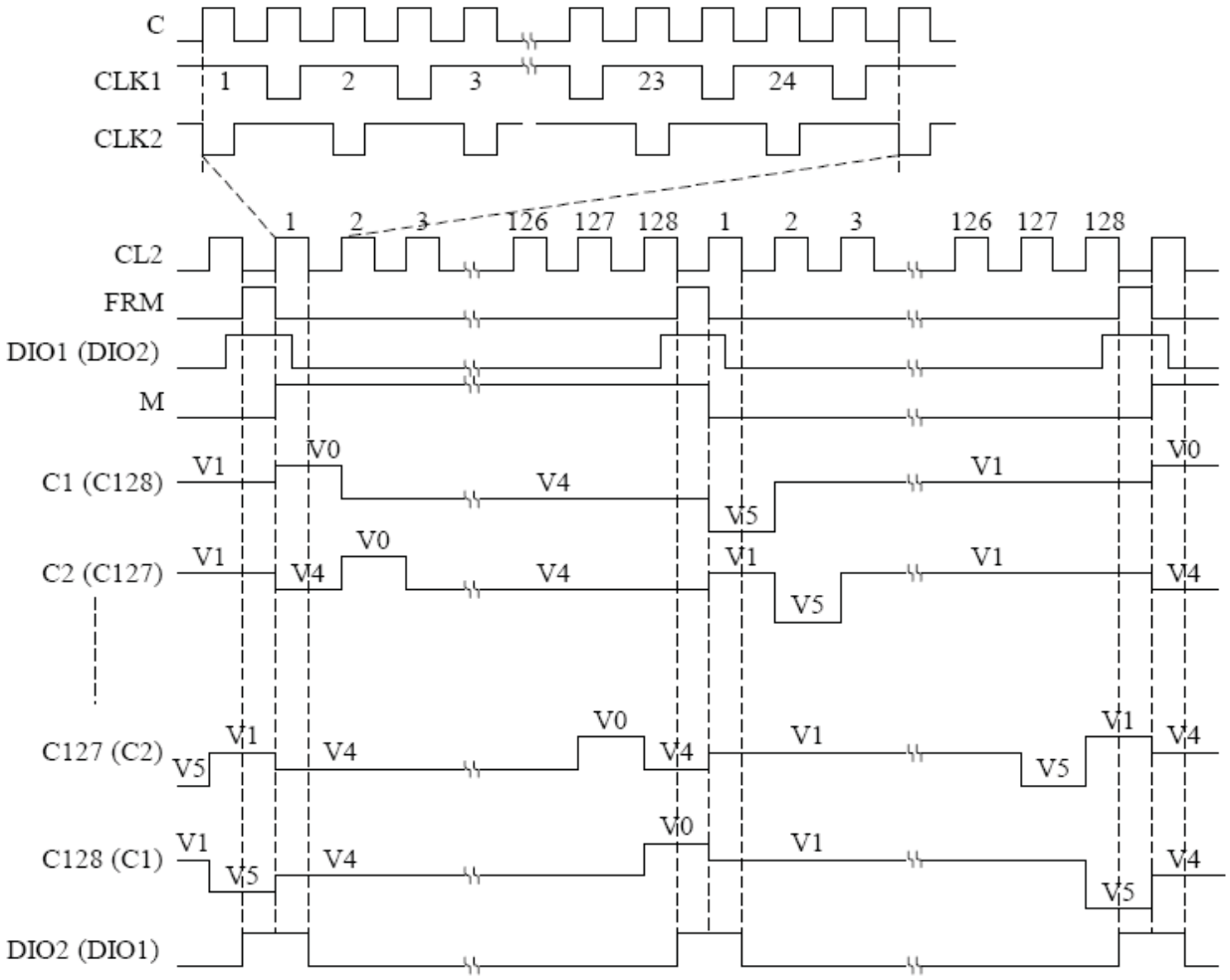


Relation of CL2 and DIO1(DIO2)

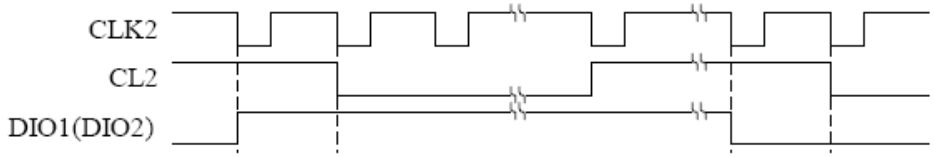


1/128 DUTY TIMING (MASTER MODE)

Condition: DS1=H, DS2=H, SHL=H(L), PCLK2=H

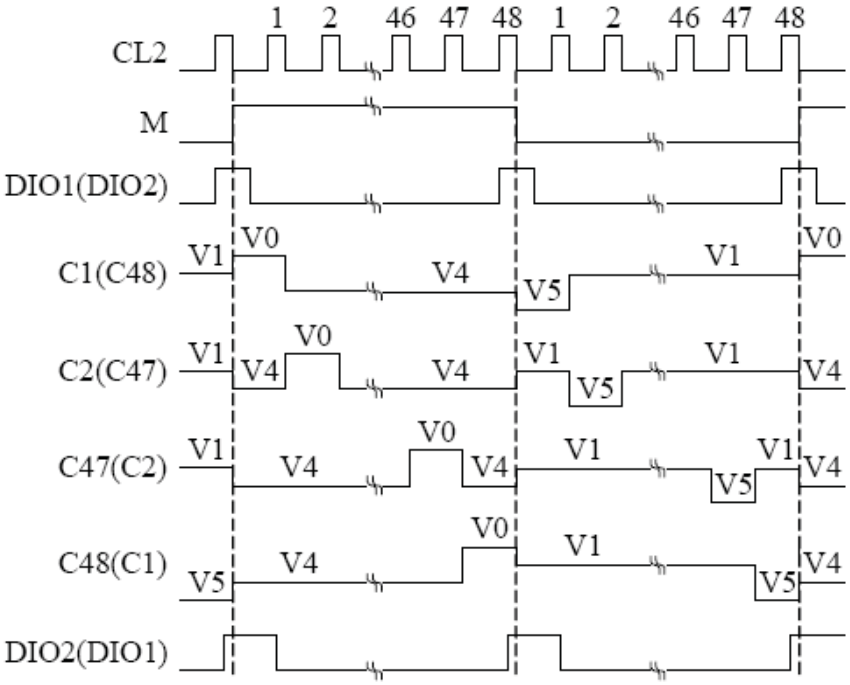


Relation of CL2 and DIO1(DIO2)



1/48 DUTY TIMING (SLAVE MODE)

Condition: SHL=H (L), PCLK2=L



II.The Characteristics and The Reliability Test

1.Electro-Optic Characteristics:

Condition: TEMP=(23±3)℃ Hum=(70±5)%RH

V_{dd}: 5.0V

Evaluate value

NO	Item		Symbol	Min	Typ.	Max	Unit	Condition
1	Supply Voltage(Logic)		Vdd-Vss		5.0		V	
2	LCD Operating Voltage		Vdd-V_0		10.1		V	-20℃
				9.5	9.7	9.9	V	25℃
					9.3		V	70℃
3	Response Time		Ton		97		ms	
			Toff		131		ms	
4	Contrast		CR	2	3			
5	Viewing Angel	12H	θ 1		40		Deg.	(CR≥3.0)
		6H	θ 2		58			
		3H	θ 3		55			
		9H	θ 4		55			

2. Characteristics of backlight (LED unit)

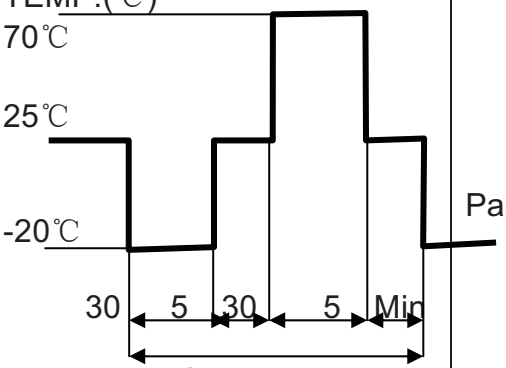
Color: Yellow Green

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Forward Voltage	Vf	—	4.2	4.6	V	If=100mA
Forward Current	If	—	100	200	mA	
Power Dissipation	Pd	—	--	0.92	W	If=100mA
Reverse Voltage	Vr	—	--	10.0	V	
Reverse Current	Ir	—	--	0.30	mA	
Luminous Intensity	Iv	20	--	—	cd/m 2	If=100mA
Luminous Uniformity	ΔLv	70	--	—	%	If=100mA
Emission Wavelength	λP	568	--	572	nm	If=10mA Ta=25° C Each chip

WARNING:

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

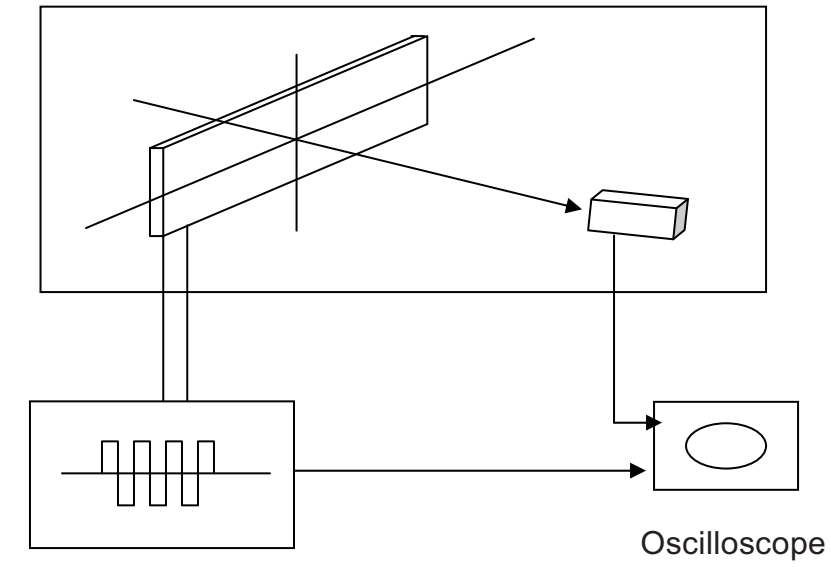
3.Reliability Test

No	Items	Test Condition	Test Result
1	High TEMP Storage	TEMP: 80±2℃ Time: 96h Restore:24h	Passed
2	Low TEMP Storage	TEMP: -30±3℃ Time: 96h Restore:24h	Passed
3	High TEMP Operating	TEMP: 70±2℃ Vop: 5V Timp: 24h Restore:24h	Passed
4	Low TEMP Operating	TEMP:-20±2℃ Vop: 5V Timp: 24h Restore:24h	Passed
5	High TEMP High Hum Storage	TEMP:40±2℃ Hum: 95%Rh Time: 96h Restore:24h	Passed
6	Thermal Shock	TEMP:(℃)  Restore:24h	Passed

III.The LCD Measuring Method and Equipment

1. Threshold Voltage and Response Time Measuring

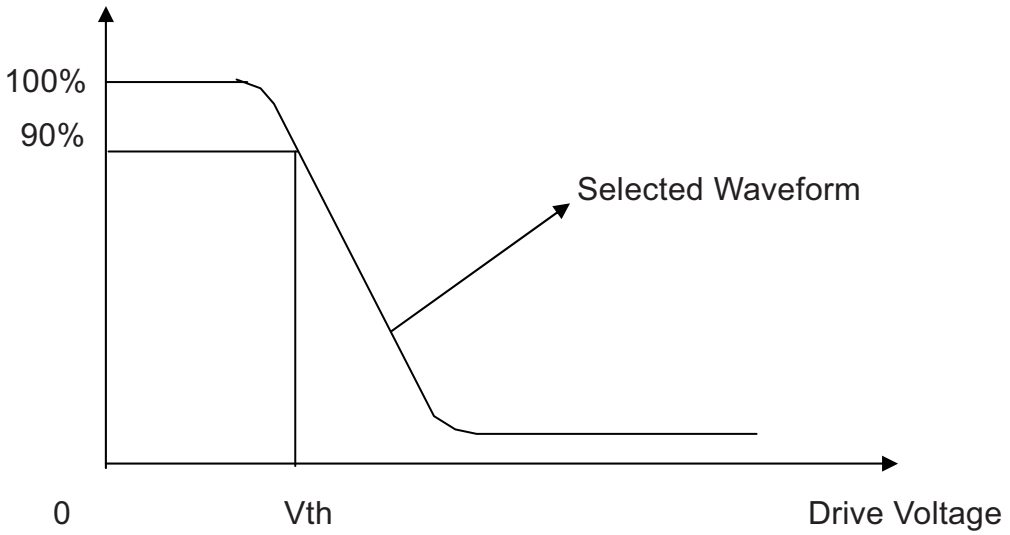
(1) Equipment



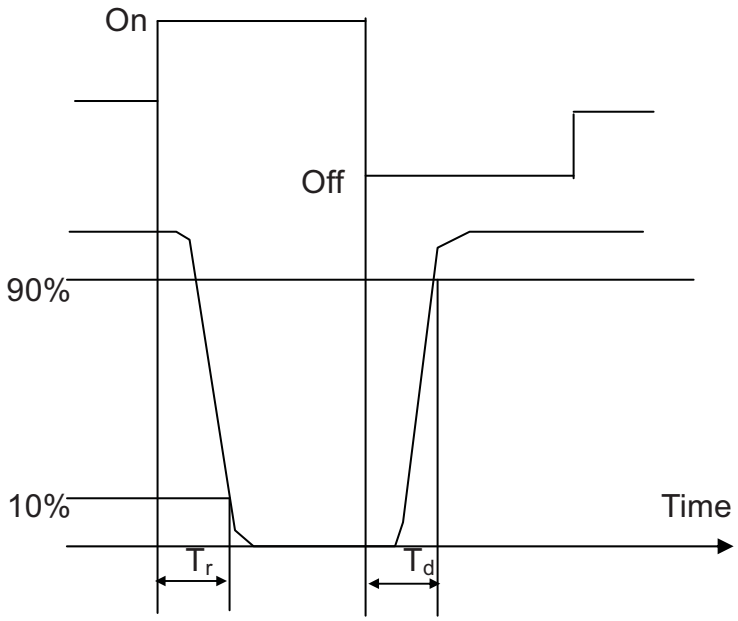
(2) Definition

A. Threshold Voltage (Vth)

Brightness

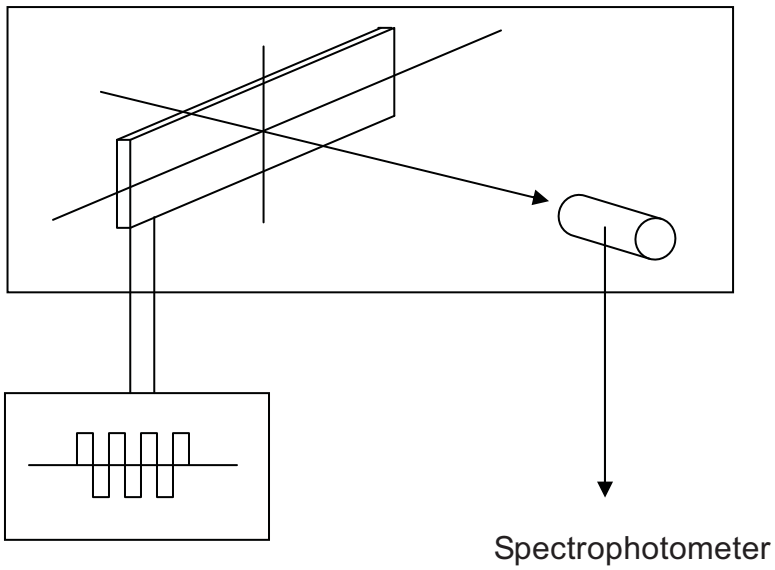


B. Response Time



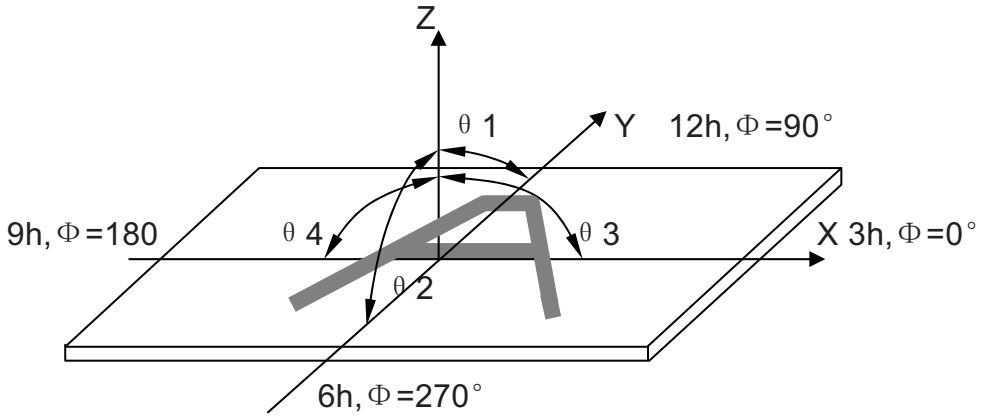
2. Contrast Measuring

(1) Equipment



(2)Definition:

A.Viewing Angle:



B. 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:：

1.1The test must be under 40W fluorescent light, and the distance of view must be at 30cm.

1.2 The test direction is based on around -10°- 30° of Vertical line.

2.Quality specification

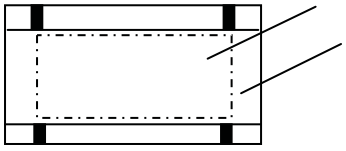
It shall be based on GB2828-87, Apply level II, Normal inspection by single sampling.

	IETM	CHECK LEVEL	AQL
MAJOR (MA)	1.LIQUID CRYSTAL LEAKAGE 2.WRONG POLARIZER 3.OUTSIDE DIMENSION 4.SEGMENT MISSING 5.SEGMENT SHORT	II	0.25
MINOR (MI)	1.BLACK SPOTS OR WHITE SPOTS. 2.FOREIGN SUBSTANCE, 3.WHITE SPOTS, 4.PINHOLE,SEGMENT 5.DEFORMATION SCRATCHS(GLASS & POLARIZER), 6.SEGMENT DEFECT, 7.AIR BUBBLES BETWEEN GLASS & POLARIZER, 8.COLOR VARIATION,GLASS CHIPS, 9.OTHER VISUAL DEFECTS.	II	1.0

3. Definition of area:

3.1 Ⅰ area: viewing area

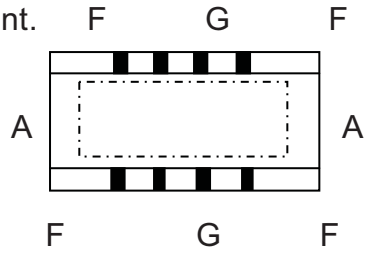
Ⅱ area: outside viewing area



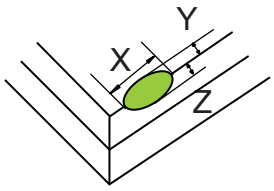
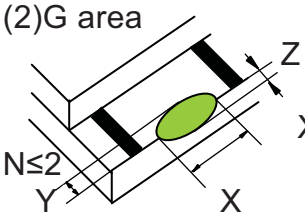
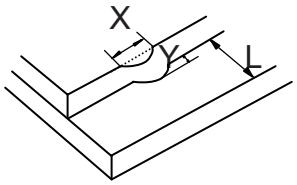
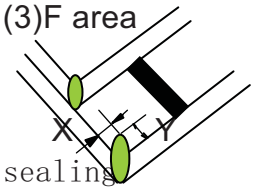
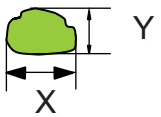
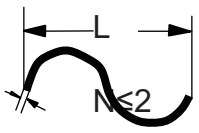
3.2 A area: The glass area outside sealant.

G area: Electrode pad area.

F area: Without electrode pad area.

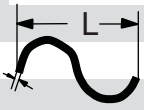
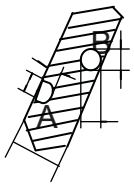
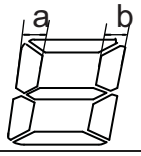
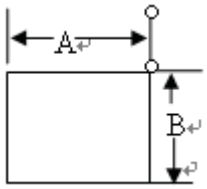


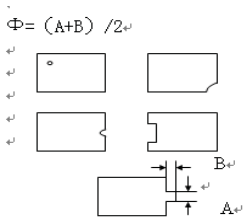
4.Standard of appearance test: (unit: mm)

№	Items	Criterion	Checking manner
1	Substrate crack X: defect Length Y: defect Width Z: defect Depth T: glass Thickness N: defect QTY L:Connector Width	(1) A area  X≤3.0 Y：Don't allowed hurt sealing Z≥T/2 N≤3 X≤5.0 Y：Don't allowed hurt sealing Z≤T/2 N≤3 X≤1.0 Y≤0.5 Z≤T/3 No check (2)G area  X≤3.0 Y≤0.5 Z≤T/2  X≤total length Y≤1/4L N≤1 Over the drawing tolerance is not allowed (3)F area  X≤2.0 Y≤3 Z≤T N≤3 Don't allowed hurt	checking with eyes
2	Black spot white spot D=(X+Y)/2 Line	(1)  0.2<D≤0.25 N≤1 0.1<D≤0.2 N≤3 D≤0.1 No check (2)  L≤2.0 W≤0.03 L≤1.0 W≤0.05 N≤1 W	Checking on the table with light and polarizer and checking with eyes directly.

№	Items	Criterion	Checking manner
3	Polarizer Bubble	D≤0.15 No check 0.15<D≤0.4 N≤2	Checking on the table with light and polarizer, and checking with eyes directly
4	Rainbow Color	Allow tiny rainbow Allow 5% color contrast or accord limitative sample	Checking on the table with light and polarizer, And checking with eyes directly
5	END Seal	1. Dimension accord design require 2. Inject depth（d）：1/5D≤d≤D （D：seal design depth）	Checking with eyes
6	Polarizer or pad appearance	No dirty	Checking with eyes

5 Standard of display test

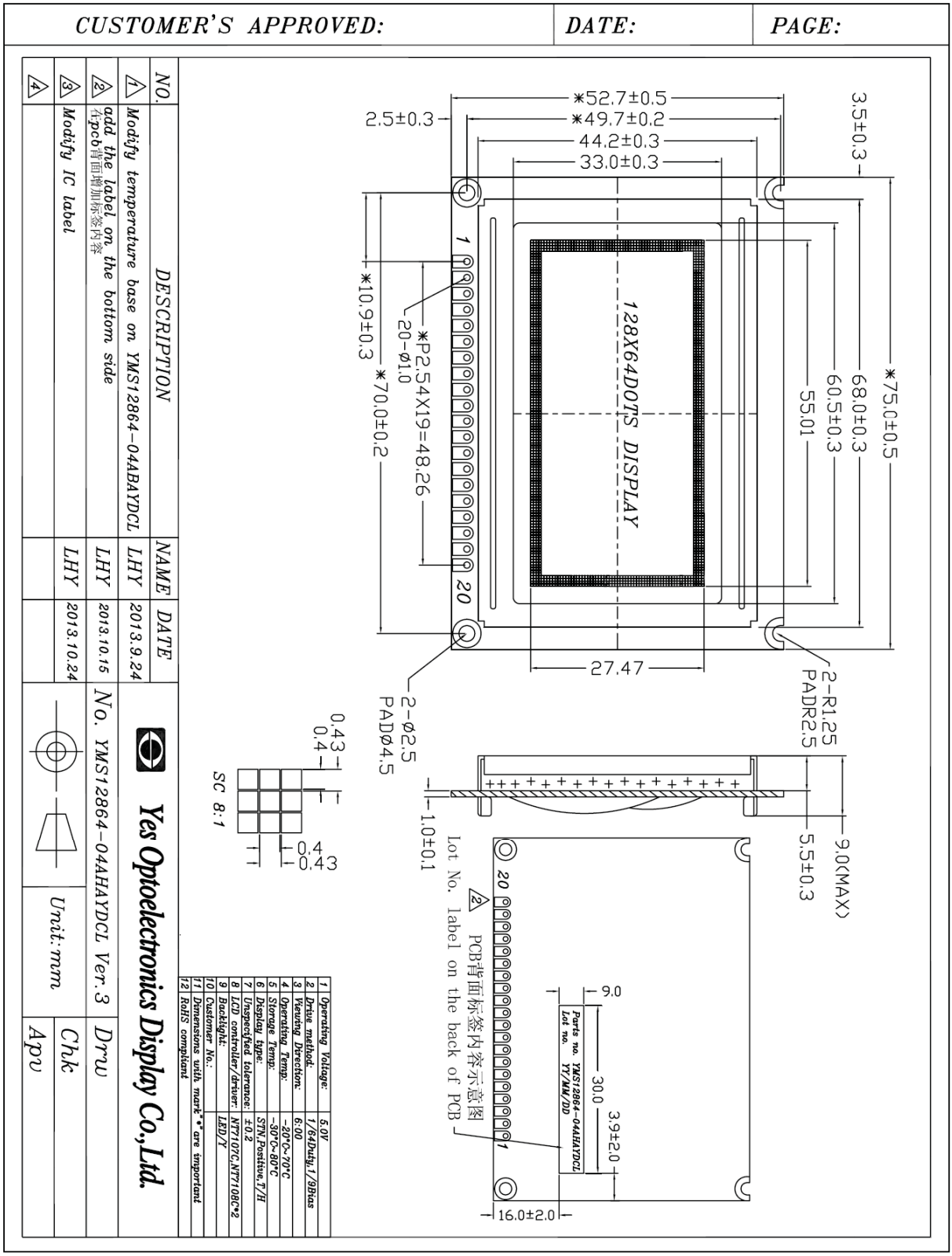
№	Items	Criterion	Checking manner
1	Black spot white spot D=(X+Y)/2 Line	(1)  0.2<D≤0.25 N≤1 0.1<D≤0.2 N≤3 D≤0.1 No check (2)  L≤2.0 W≤0.03 N≤2 L≤1.0 W≤0.05 N≤1	Checking at the display state
2	Pin hole D=(A+B)/2 W: segment width	 W≤0.4 D≤0.20 And D≤1/2W N≤1 W>0.4 D≤0.25 And D≤1/3W N≤2 D≤0.05 No check	Checking at the display state
3	Different width of segment	 |a-b|<0.25 or |a-b|≤1/4W No check	Checking at the display state
4	Different width		A：distortion≤10% B：distortion≤10% Superfluous Electrode lines display is not allowed

5	Pinhole		0.15＜Φ≤0.2 N≤1 0.05＜Φ≤0.15 N≤3 Φ≤0.05 Any number Note: Distance between two spots ≥ 10mm，Φ〈1/3 pixels

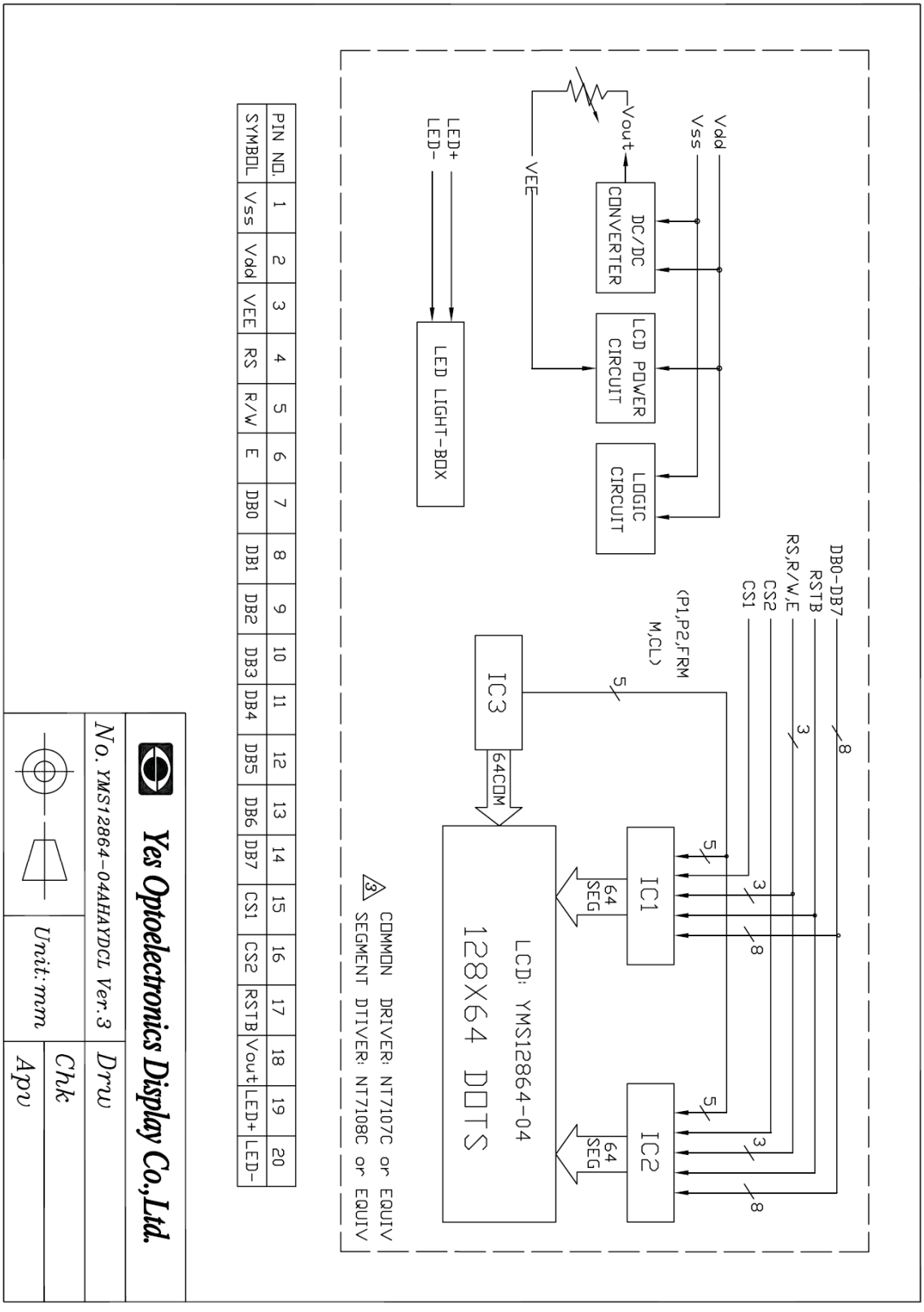
6.Inspection Item and Standards

Item	The Standard Of Quality Inspection	Checking Method	Quantity 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 with the ground pad.	Checking With Eyes And Using Vernier Caliper, Multimeter	100%
The Relative Position of LCD and Frame	The end seal of the LCD must be at the same side with the frame's opening.	Checking With Eyes	100%
The Relative Position of PCB/Panel /Frame	The frame installing direction must be correct.the twisted angle of the leg is from 45° to 60° ,the leg is vertical to PCB panel and it must be in the middle position of the installing holes.	Checking With Eyes	100%
LED	1.The LED must be Yellow Green. 2.The LED must be uniform.	Checking With Eyes	100%
Function Test	1. The major defects must be reject. 2. Background changes evenly and no disorderly displaying phenomenon. 3. Display no shortage.	Check It When Displaying	100%

V .Attached Drawing



CUSTOMER'S APPROVED:	DATE:	PAGE: /



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SYMBOL	Vss	Vdd	VEE	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	CS1	CS2	RSTB	Vout	LED+	LED-

Yes Optoelectronics Display Co.,Ltd.

No. YMS12864-04AHAYDCL Ver.3 | Drw

Unit: mm | Chk

Apv

VI. Packing

CUSTOMER'S APPROVED:	DATE:2013.10.10	PAGE: 1/1

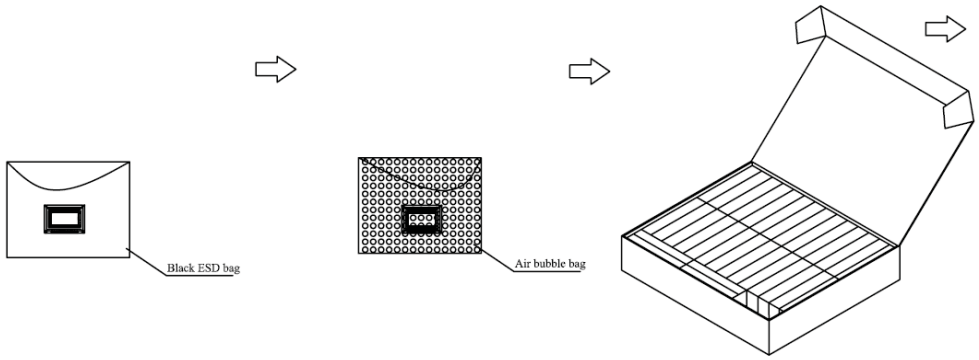
PRODUCT PART NO.:YMS12864-04AHAYDCL

Packing Process:

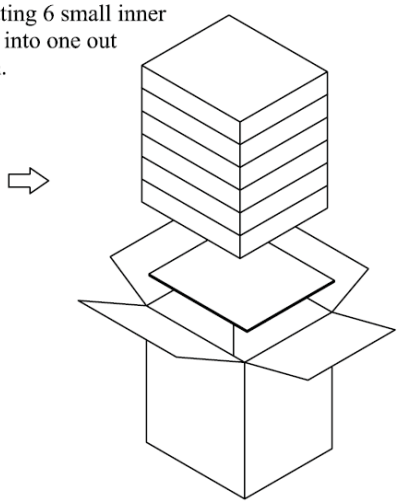
1) Putting Modules into each black ESD bag.

2) Putting Modules with black ESD bag into the air bubble bag.

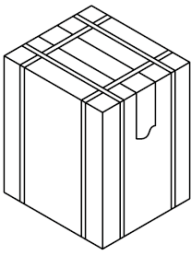
3) Putting 90 pcs Modules into the inner box (TYPE:H67) and space filled filling piece.



4) Putting 6 small inner boxes into one out carton.



5) Packing finished.



Note: 90x6=540pcs/Outcarton

Dimension (Small carton): 385*325*72mm

Dimension (Out carton): 394*344*470mm

NO. YMS12864-04AHAYDCL	Drw:		Chk:		Apv:	

ANSHAN YES OPTOELECTRONICES DISPLAY CO., LTD

Ⅶ.Precautions For Use

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.

2.Storage Conditions

(1) Store the panel or module in a dark place where the temperature is 25±5°C and the humidity is 50±20%RH.

(2) Store in anti-static electricity container.

(3) Store in clean environment, free from dust, active gas, and solvent.

(4) Do not place the module near organics solvents or corrosive gases.

(5) Do not crush, shake, or jolt the module.

(6) Do not exposed to direct sun light of fluorescent lamps.

3.Installing LCD Module

Attend to the following items when installing the LCM.

(1) Cover the surface with a transparent protective plate or touch panel to protect the polarizer and LC cell.

(2) When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements.

4.Precautions For Operation

(1) Viewing angle varies with the change of liquid crystal driving voltage (Vo). Adjust Vo to show the best contrast.

(2) Driving the LCD in the voltage above the limit will shorten its lifetime.

(3) Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.

(4) When turning the power on, input each signal after the positive/negative voltage becomes stable.

(5) Do not apply water or any liquid on product which composed of T/P.

5.Handling Precautions

(1) Avoid static electricity which can damage the CMOS LSI; please wear the wrist strap when handling.

(2) The polarizing plate of the display is very fragile. so, please handle it very carefully.

(3) Do not give external shock.

(4) Do not apply excessive force on the surface; it may cause display abnormal .

(5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.

(6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.

(7) Do not operate it above the absolute maximum rating.

(8) Do not remove the panel or frame from the module.

(9) Do not apply water or any liquid on product which composed of T/P.