



ANSHAN YES OPTOELECTRONICS DISPLAY CO.,LTD

**SPECIFICATIONS FOR
LIQUID CRYSTAL DISPLAY MODULE**

MODEL NO.: YMS162-08AAAGDGN

DATE:JAN.18.2011

Approved	Checked	Department

CUSTOMER:

MODEL NO.:

DATE:

Approved	Checked	Department

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I .General Specifications

1.The Features :

- (1). Low power consumption 5.0V power supply
- (2). Drive method: 1/16 duty, 1/5 bias
- (3). Viewing direction: 6:00
- (4). Operating tempration: 0~50°C
- (5). Storage tempration: -20~70°C
- (6). Display type: STN mode, Transflective, Positive type display

2.Mechanical Data and Conditions:

- (1) Number of Characters----- 16 Characters* 2 Line
- (2) Module Size-----65.0 w * 27.7 h mm
- (3) Viewing Area ----- 61.0 w * 15.7 h mm
- (4) Dot Size -----0.55 w * 0.60 h mm
- (5) Character Size ----- 2.95 w * 5.15 h mm
- (6) Outline Dimensions-----See Attached Drawing

3. Absolute Maximum Ratings

Power Supply Voltage (V_{DD}) -0.3V to +7.0V

Power Supply Voltage (V₁ to V₅)

. GND to V_{DD} + 0.3V

Input Voltage (V_I) -0.3V to V_{DD} + 0.3V

- All voltage values are referenced to GND = 0V
- V₁ to V₅, must maintain V_{DD} ≥ V₁ ≥ V₂ ≥ V₃ ≥ V₄ ≥ V₅ ≥ GND

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4.Pin Connections:

Pin No.	Symbol	Function
1	Vss	Ground
2	VL	LCD Driver Voltage Input
3	VDD	Logic Supply Voltage
4	RS	Data/Instruction Register Select
5	R/W	Read/Write Select
6	E	Enable Signal
7-14	DB0-DB7	Data Bus Line

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5. AC CHARACTERISTICS

Read Cycle ($V_{DD} = 4.5V \sim 5.5V$, $GND = 0V$, $T_A = 25^\circ C$)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
t _{cyce}	Enable Cycle Time	500	-	-	ns	Figure 1
t _{whe}	Enable "H" Level Pulse Width	300	-	-	ns	Figure 1
t _{re} , t _{fe}	Enable Rise/Fall Time	-	-	25	ns	Figure 1
t _{as}	RS, R/W Setup Time	60 ¹	-	-	ns	Figure 1
		100 ²				
t _{ah}	RS, R/W Address Hold Time	10	-	-	ns	Figure 1
t _{rd}	Read Data Output Delay	-	-	190	ns	Figure 1
t _{dhr}	Read Data Hold Time	20	-	-	ns	Figure 1

Write Cycle ($V_{DD} = 4.5V \sim 5.5V$, $GND = 0V$, $T_A = 25^\circ C$)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
t _{cyce}	Enable Cycle Time	500	-	-	ns	Figure 2
t _{whe}	Enable "H" Level Pulse Width	300	-	-	ns	Figure 2
t _{re} , t _{fe}	Enable Rise/Fall Time	-	-	25	ns	Figure 2
t _{as}	RS, R/W Setup Time	60 ¹	-	-	ns	Figure 2
		100 ²				
t _{ah}	RS, R/W Address Hold Time	10	-	-	ns	Figure 2
t _{ds}	Data Output Delay	100	-	-	ns	Figure 2
t _{dhw}	Data Hold Time	10	-	-	ns	Figure 2

Notes: 1: 8-bit operation mode
2: 4-bit operation mode

Power Supply Conditions Using Internal Reset Circuit

($V_{DD} = 4.5V \sim 5.5V$, $GND = 0V$, $T_A = 25^\circ C$)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
t _{ron}	Power Supply Rise Time	0.1	-	10	ms	Figure 3
t _{off}	Power Supply OFF Time	1	-	-	ms	Figure 3

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Read Operation

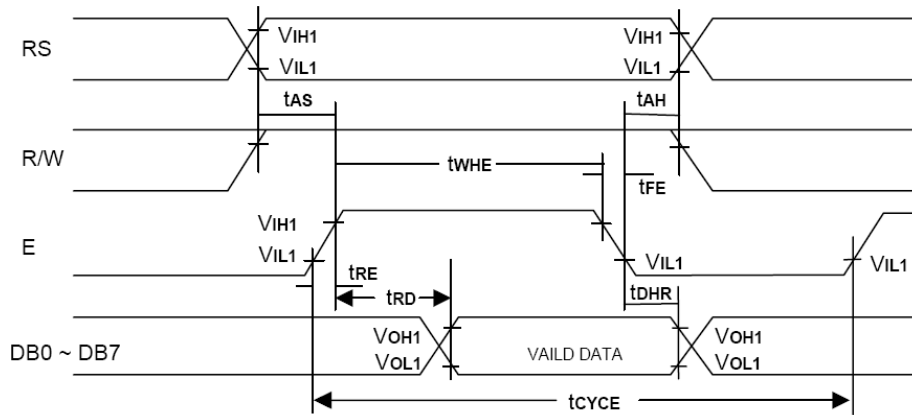


Figure 1. Bus Read Operation Sequence
(Reading out data from NT7605 to MPU)

Write Operation

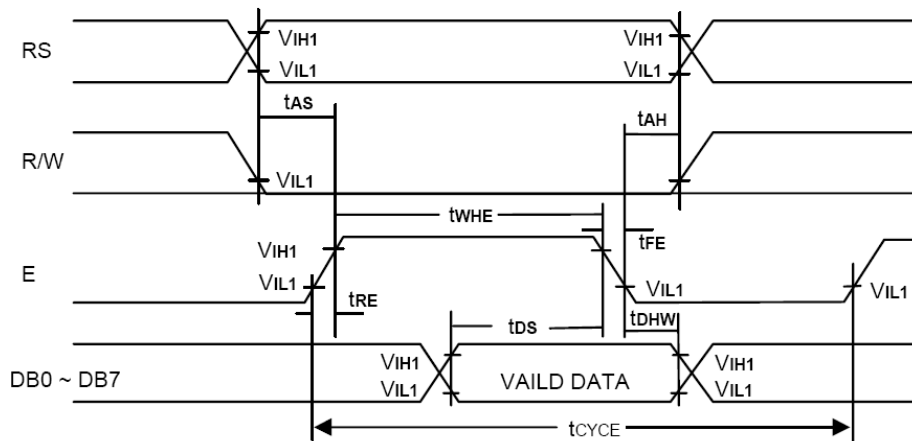


Figure 2. Bus Write Operation Sequence
(Writing data from MPU to NT7605)

Interface Signals with Segment Driver LSI



Figure 3. t_{OFF} stipulates the time of power off for instantaneous Power supply to or when power supply repeats ON and OFF.

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II.The Characteristics and Reliability Test

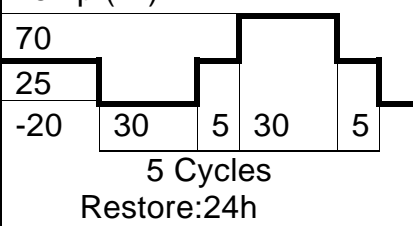
1.Electro-Optic Characteristics

Condition:TEMP=(23±3)°C

NO	Item	Symbol	Min.	Typ.	Max.	Unit	Condition
1	Supply Voltage(Logic)	Vdd-Vss		5.0		V	
2	LCD Operating Voltage	Vdd-V ₀		4.6		V	0°C
			4.2	4.4	4.6	V	25°C
				4.2		V	50°C
3	Response Time	Ton		139		ms	
		Toff		86		ms	
4	Contrast	CR	2				
5	Viewing Angel	12H	θ 1	52		Deg.	(CR≥2.0)
		6H	θ 2	69			
		3H	θ 3	62			
		9H	θ 4	62			

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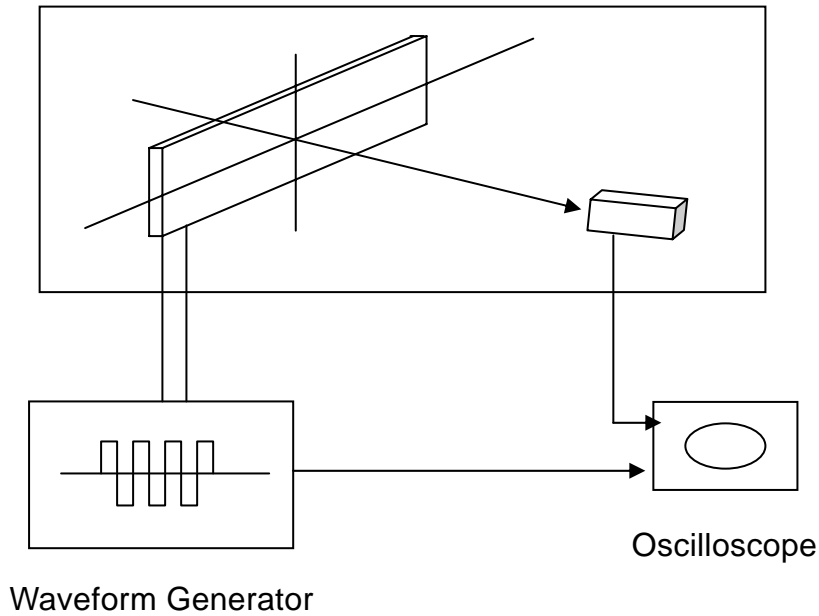
3. Reliability Test

No	Items	Test Condition	Equipment	Test Result
1	High Temp Storage	Temp: $70 \pm 2^{\circ}\text{C}$ Time:96h Restore:24h	Tenny	Passed
2	Low Temp Storage	Temp: $-20 \pm 3^{\circ}\text{C}$ Time:96h Restore:24h	Tenny	Passed
3	High Temp Operating	Temp: $50 \pm 2^{\circ}\text{C}$ Vop:5V Time:24h Restore:24h	Tenny	Passed
4	Low Temp Operating	Temp: $0 \pm 3^{\circ}\text{C}$ Vop:5V Time:24h Restore:24h	Tenny	Passed
5	High Temp High Hum Storage	Temp: $40 \pm 2^{\circ}\text{C}$ Hum:95%Rh Time:96h Restore:24h	Tenny	Passed
6	Thermal Shock	Temp:($^{\circ}\text{C}$)  70 25 -20 30 5 30 5 5 Cycles Restore:24h	Tenny	Passed

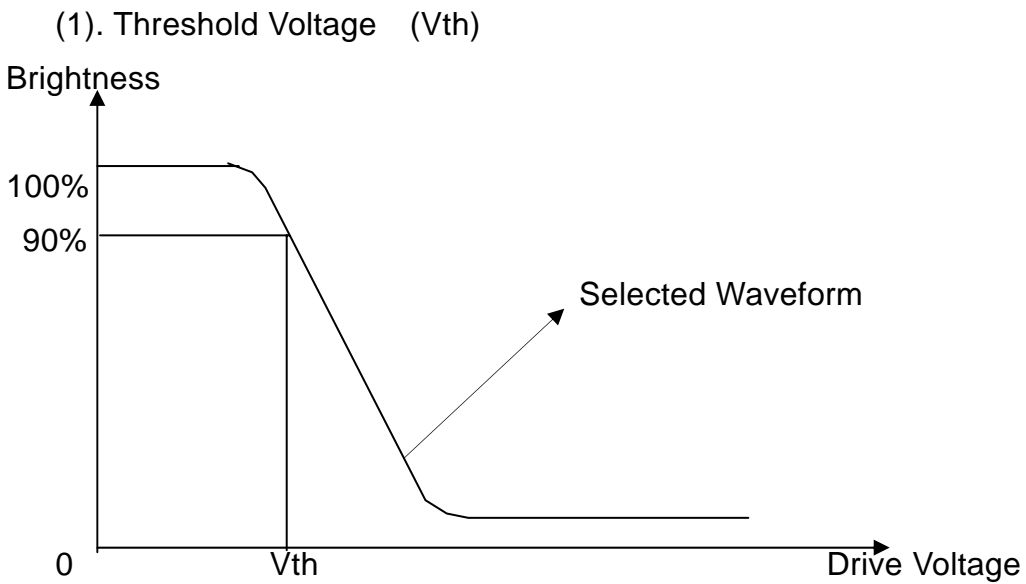
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III.The Equipment and LCD Measuring Method

1. Equipment

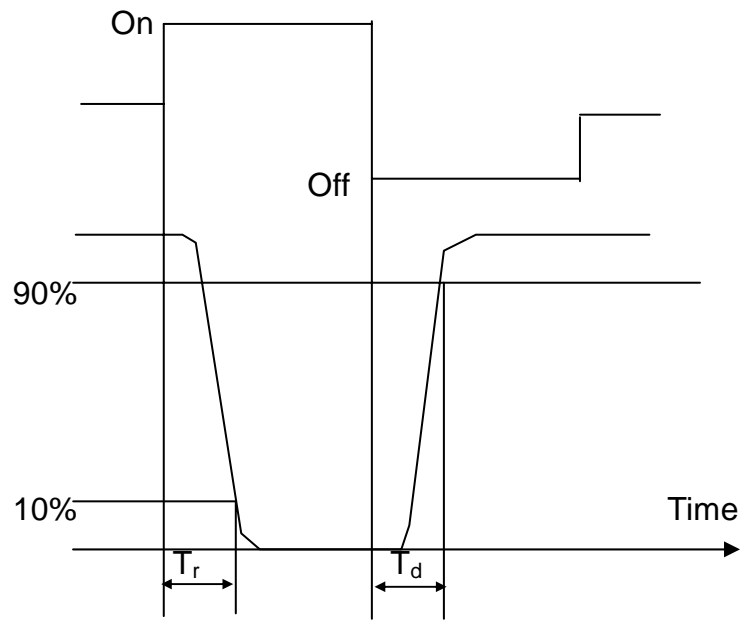


2. Definition

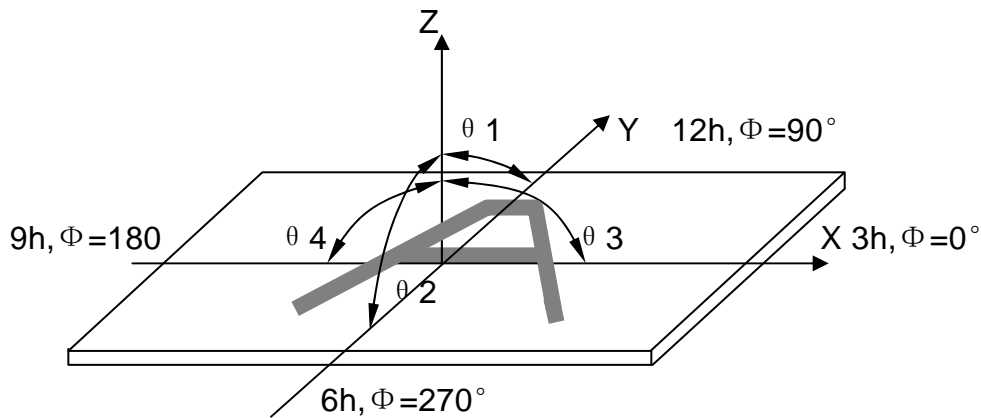


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(2). Response Time



(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

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IV. Standard Specifications for Product Quality

1.MTBF

More than 50,000 hours.

2. Manner of Test::

(1)The Test Must Be Under 40w Fluorescent Light, And The Distance Of View Must Be At 30cm.

(2)The Test Direction Is Based On Around 15° - 45° Of Vertical Line.

3. Definition Of Defects

(1) Major Defects

A:Non-Display

B:Segment Missing

C:Over Current

D:Segment Short

E:Sealant Dishardexn

F:Wrong Polarizer Direction

(2)Minor Defects: The Others.

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

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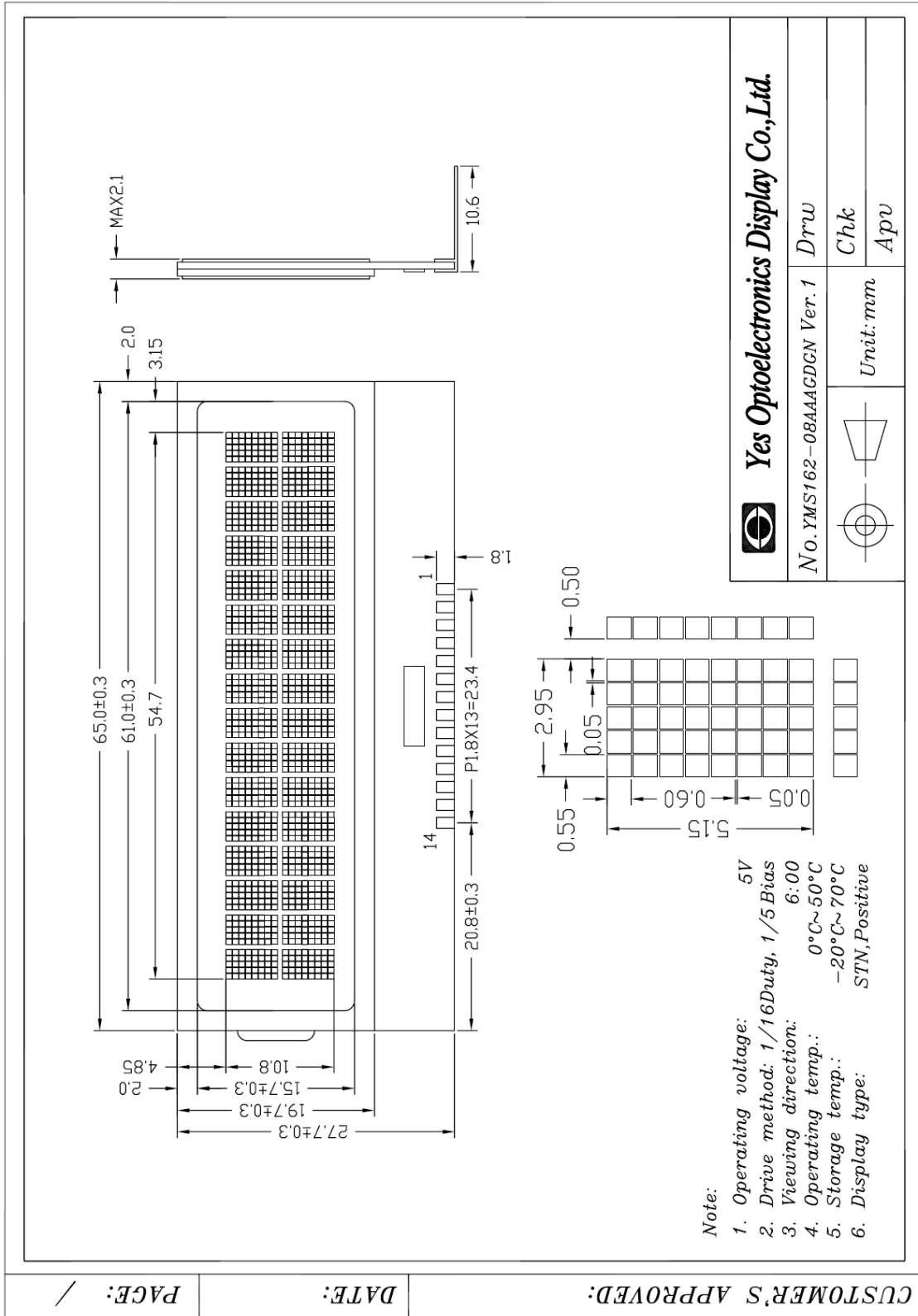
5. Inspection Item and Standards

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: $d \leq 0.35\text{mm}$,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. $d \leq 0.15\text{mm}$ $n \leq 2$ diameter of bubble' $d \leq 0.5$ $n \leq 2$ damaged size of polarizer.	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 Panel and 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	<ol style="list-style-type: none"> 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%

Note:D~Diameter N~Quantity Unit:mm

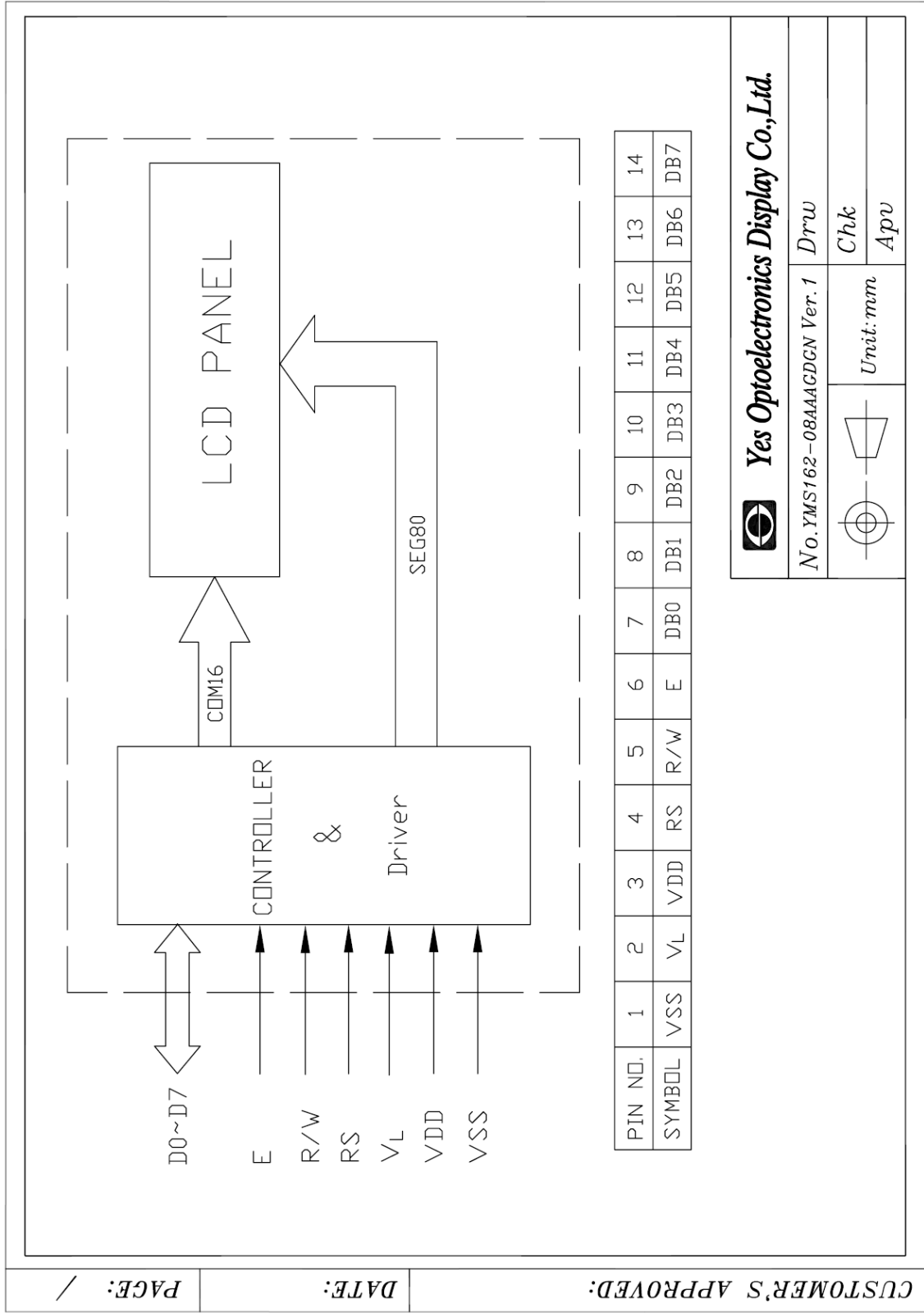
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V.Attached Drawing



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 **Yes Optoelectronics Display Co., Ltd.**

No. YMS162-08AAAGDGN Ver. 1 *Drw*

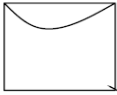
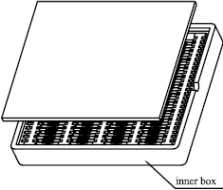
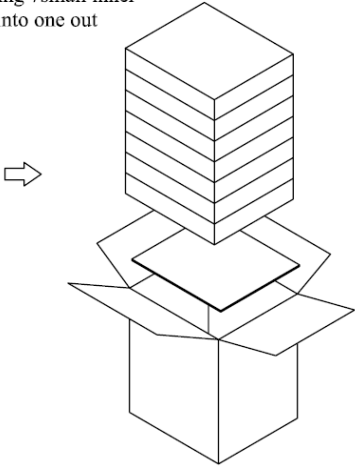
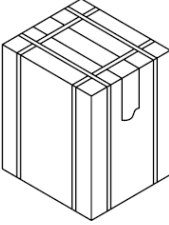
 *Chk*

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VI. Packing

<i>CUSTOMER'S APPROVED:</i>	<i>DATE: 2011.01.18</i>	<i>PAGE: 1/1</i>
<p>PRODUCT PART NO.:YMS162-08AAAGDGN</p> <p>Packing Process:</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>1) Putting Modules into each black ESD bag</p>  <p style="text-align: center; font-size: small;">Black ESD bag</p> </div> <div style="width: 45%;"> <p>2) Putting 96 pcs Modules into the inner box (TYPE:BEPS378*330*57) and space filled filling piece</p>  <p style="text-align: center; font-size: small;">inner box</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="width: 45%;"> <p>3) Putting 7small inner boxes into one out carton</p>  </div> <div style="width: 45%;"> <p>4) Packing finished</p>  </div> </div> <p style="margin-top: 20px;">Note: 96x7=672pcs/Outcarton Dimension (Small box): 378*330*57mm Dimension (Out carton): 394*344*470mm</p>		
NO. YMS162-08AAAGDGN	Ver. 1	Drw: _____
_____	Chk: _____	Apv: _____
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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 $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\% \text{RH}$.
- (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 (V_o). Adjust V_o 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.

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(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.

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