



Mono STN Display Module

Product Specification

Part No. YMS-12864-15CFCBDGL

128 x 64 STN Blue mode Display

For more information, please visit www.andersdx.com
or email info@andersdx.com

Version 1.0

SPECIFICATIONS FOR LIQUID CRYSTAL DISPLAY MODULE

MODEL NO.: YMS12864-15CFCBDGL

DATE: SEP.27.2011

Approved	Checked	Department

CUSTOMER:

MODEL NO.:

DATE:

Approved	Checked	Department

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CFCBDGL	Page 1 of 18

LIST

I . General Specifications -----(3-5)

II . The Characteristics and Reliability Test -----(6-7)

III. The Equipment and LCD Measuring Method-----(8-9)

IV. Standard Specifications for Product Quality -----(10-13)

V . Attached Drawing -----(14-15)

VI.Packing -----(16)

VII. Precautions For Use-----(17-18)

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CFCBDGL	Page 2 of 18

I .General Specifications

1.The Features :

- (1).The module operating voltage: 3.0V
- (2).Drive method: 1/65 duty,1/9 bias
- (3). Viewing direction: 6:00
- (4). Operating temperature: -20~70°C
- (5). Storage temperature: -30~80°C
- (6). Display type: STN-BLUE mode, Transmissive, Negative type display

2.Mechanical Data and Conditions:

- (1) Module Size ----- 93.70(W) * 53.15(H)mm
- (2) Viewing Area ----- 70.7(W) *38.8(H)mm
- (3) Dot Size ----- 0.48(W) * 0.48(H)mm
- (4) Number of Dots ----- 128 * 64 Dots
- (5) Outline Dimensions----- See Attached Drawing

3. Absolute Maximum Ratings

DC Supply Voltage (VDD, VDD2, VDD3)	-0.3V to +4.0V
DC Supply Voltage (VOUT)	-0.3V to +15.0V
DC Supply Voltage (V0)	-0.3V to +15.0V
Input Voltage (Vin)	-0.3V to VDD+0.3V

***Comments**

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to this device. These are stress ratings only. Functional operation of this device under these or any other conditions above those indicated in the operational sections of this specification is not implied or intended. Exposure to the absolute maximum rating conditions for extended periods may affect device reliability.

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 3 of 18

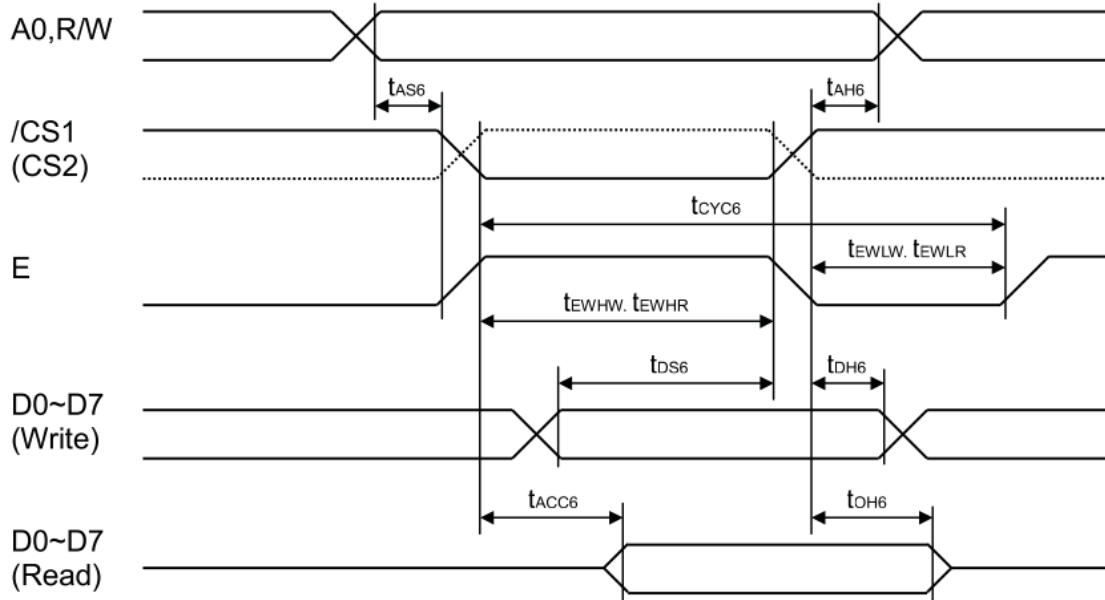
4.Pin Connections:

Pin No.	Symbol	Function
1	/CS1	Chip select input pins
2	/RES	Reset input pin
3	A0	This is connected to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or a command.
4	R/W	Read/Write control signal input terminal
5-13	D0-D7	Data bus
14	VDD	Power supply
15	VSS	Ground
16	VOUT	DC/DC voltage converter output
17	CAP3+	Capacitor 3+ pad for internal DC/DC voltage converter
18	CAP1-	Capacitor 1- pad for internal DC/DC voltage converter
19	CAP1+	Capacitor 1+ pad for internal DC/DC voltage converter
20	CAP2+	Capacitor 2+ pad for internal DC/DC voltage converter
21	CAP2-	Capacitor 2+ pad for internal DC/DC voltage converter
22-25	V1-V4	LCD driver supplies voltages
26	V0	LCD driver supplies voltages

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CFCBDGL	Page 4 of 18

5. AC CHARACTERISTICS

System Buses Read/Write Characteristics (for 6800 Series MPU)



(VDD = 2.7 ~ 3.6V, Ta = -40 ~ +85°C)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
tAH6	Address hold time	0	-	-	ns	A0, R/W
tAS6	Address setup time	0	-	-	ns	
tCYC6	System cycle time	240	-	-	ns	
tEWHW	Control high pulse width (write)	90	-	-	ns	E
tEWHR	Control high pulse width (read)	120	-	-	ns	E
tEWLW	Control low pulse width (write)	100	-	-	ns	E
tEWLR	Control low pulse width (read)	60	-	-	ns	E
tDS6	Data setup time	40	-	-	ns	D0~D7
tDH6	Data hold time	0	-	-	ns	
tACC6	/RD access time	-	-	140	ns	D0~D7 CL = 100pF
tOH6	Output disable time	5	-	50	ns	

DATE SEP. 27.2011

TECHNICAL
SPECIFICATION

LCM

YMS12864-15CF CBDGL

Page 5 of 18

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		3.0		V	
2	LCD Operating Voltage	Vdd-V ₀		8.9		V	-20°C
			8.3	8.5	8.7	V	25°C
				8.1		V	70°C
3	Response Time	Ton		89		ms	
		Toff		300		ms	
4	Contrast Ratio	CR	2				
5	Viewing Angle	12H	θ 1	45		Deg.	(CR≥2.0)
		6H	θ 2	55			
		3H	θ 3	50			
		9H	θ 4	50			

2. Characteristics of backlight (LED unit)

Color:white

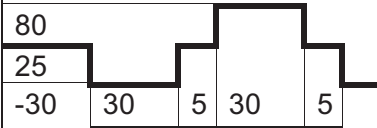
	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Forward Voltage	V _f	--	4.0	--	V	V _f =4.0 V
Forward Current	I _f	30		40	mA	
Power Dissipation	P _d			0.16	W	V _f =4.0 V
Reverse Voltage	V _R			5	V	
Reverse Current	I _R			0.2	mA	
Luminous Intensity	I _V	70			cd/m ²	V _f = 4.0V
Luminous Uniformity	ΔI _V	70			%	
Chromaticity coordinate	X	X=0.270	--	X=0.320		I _f =20mA Ta=25°C Each chip
	Y	Y=0.270	--	Y=0.320		

WARNING:

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

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 6 of 18

3. Reliability Test

No	Items	Test Condition	Equipment	Test Result
1	High Temp Storage	Temp: $80 \pm 2^{\circ}\text{C}$ Time: 96h Restore: 24h	Tenny	Passed
2	Low Temp Storage	Temp: $-30 \pm 3^{\circ}\text{C}$ Time: 96h Restore: 24h	Tenny	Passed
3	High Temp operating	Temp: $70 \pm 2^{\circ}\text{C}$ Vop: 3.0V Time: 24h Restore: 24h	Tenny	Passed
4	Low Temp operating	Temp: $-20 \pm 3^{\circ}\text{C}$ Vop: 3.0V 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: ($^{\circ}\text{C}$)  5 Cycles Restore: 24h	Tenny	Passed

DATE SEP. 27.2011

TECHNICAL SPECIFICATION

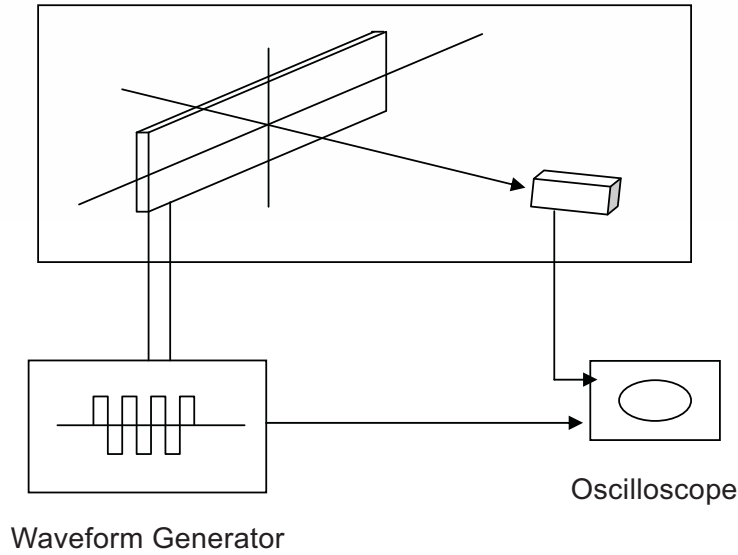
LCM

YMS12864-15CF CBDGL

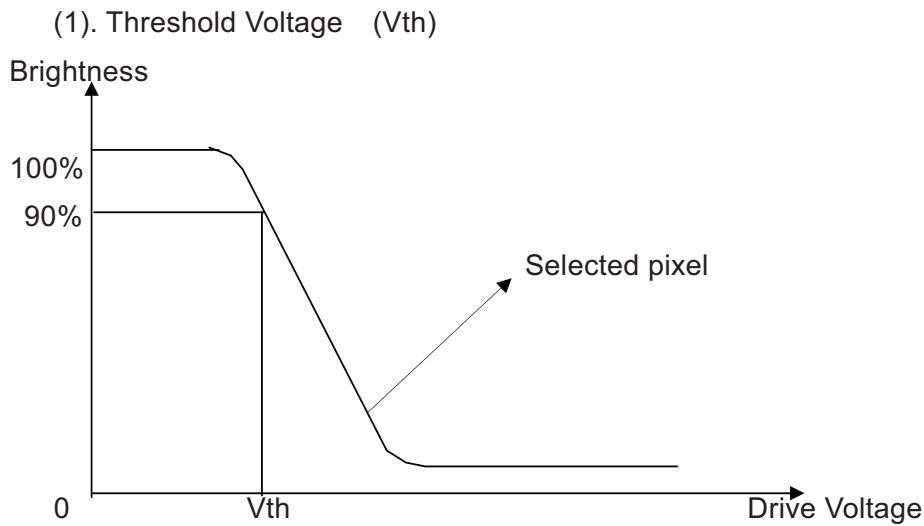
Page 7 of 18

III. The Equipment and LCD Measuring Method

1. Equipment

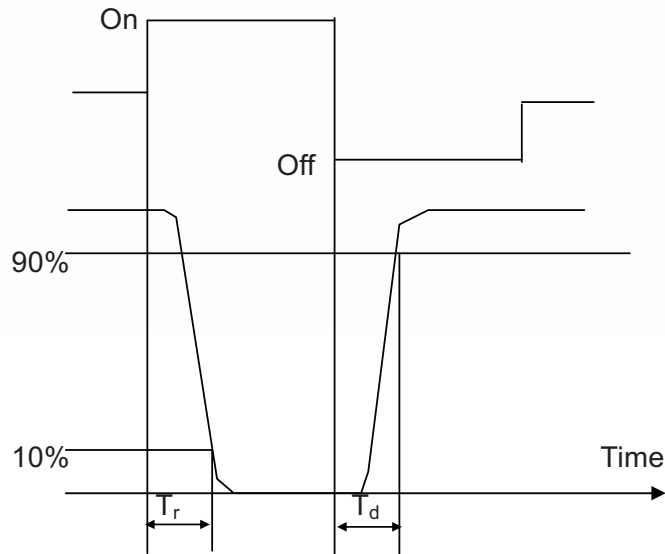


2. Definition

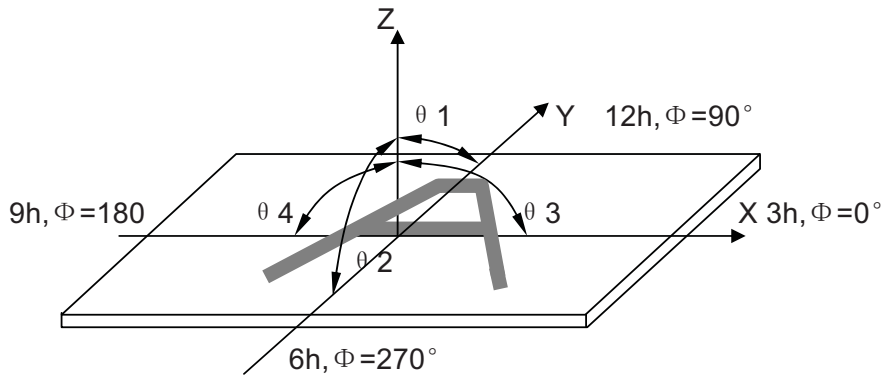


DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 8 of 18

(2). Response Time



(3). Viewing Angle:



(4). Contrast Ratio (Positive)

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

3. Reliability Test:

Equipment : TENNY

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 9 of 18

IV. Standard Specifications for Product Quality

1.MTBF

More than 50,000 hours.

2. Method of Test::

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

(2)The eye's Test Direction Is Based On the vertical direction 15° - 45° .

3. Definition Of Defects

(1) Major Defects

- A:Non-Display
- B:Segment Missing
- C:Over Current
- D:Segment Short
- E: Wrong Polarizer Direction

(2)Minor Defects: The Others.

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

The sampling inspection plan is in accordance with the Level II and normal inspection.

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CFCBDGL	Page 10 of 18

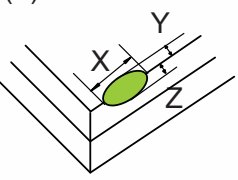
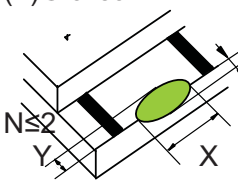
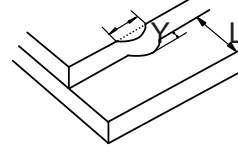
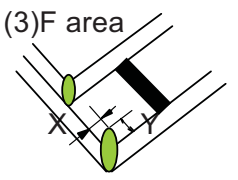
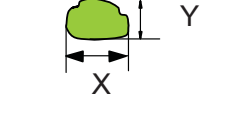
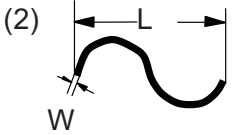
5. Inspection Item and Standards

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: $d \leq 0.35\text{mm}$, 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 White 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%

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CFCBDGL	Page 11 of 18

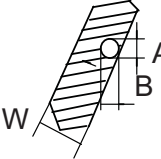
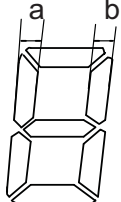
LCD:

Standard of appearance test: (unit: mm)

No	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	<p>(1) A area</p>  <p>$X \leq 3.0$ Y: Don't allowed hurt sealing $Z \geq T/2$ $N \leq 3$ $X \leq 5.0$ Y: Don't allowed hurt sealing $Z \leq T/2$ $N \leq 3$ $X \leq 1.0$ $Y \leq 0.5$ $Z \leq T/3$ No check</p> <p>(2) G area</p>  <p>Z $X \leq 3.0$ $Y \leq 0.5$ $Z \leq T/2$ $N \leq 2$</p>  <p>$X \leq 1/2$ total length $Y \leq 1/4L$ $N \leq 1$ Over the drawing tolerance is not allowed</p> <p>(3) F area</p>  <p>$X \leq 2.0$ $Y \leq 3$ $Z \leq T$ $N \leq 3$ Don't allowed hurt sealing</p>	<p>checking with eyes</p>
2	Black spot white spot $D = (X+Y)/2$ Line	<p>(1)</p>  <p>$0.2 < D \leq 0.25$ $N \leq 1$ $0.1 < D \leq 0.2$ $N \leq 3$ $D \leq 0.1$ No check II area No check</p> <p>(2)</p>  <p>$L \leq 2.0$ $W \leq 0.03$ $N \leq 2$ $L \leq 1.0$ $W \leq 0.05$ $N \leq 1$ II area No check</p>	<p>Checking on the table with light and polarizer and checking with eyes directly.</p>
DATE	SEP. 27.2011		TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 12 of 18

No	Items	Criterion	Checking manner
3	Polarizer Bubble	$D \leq 0.15$ No check $0.15 < D \leq 0.4$ $N \leq 2$ II area No check	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	Polarizer or pad appearance	No dirty	Checking with eyes

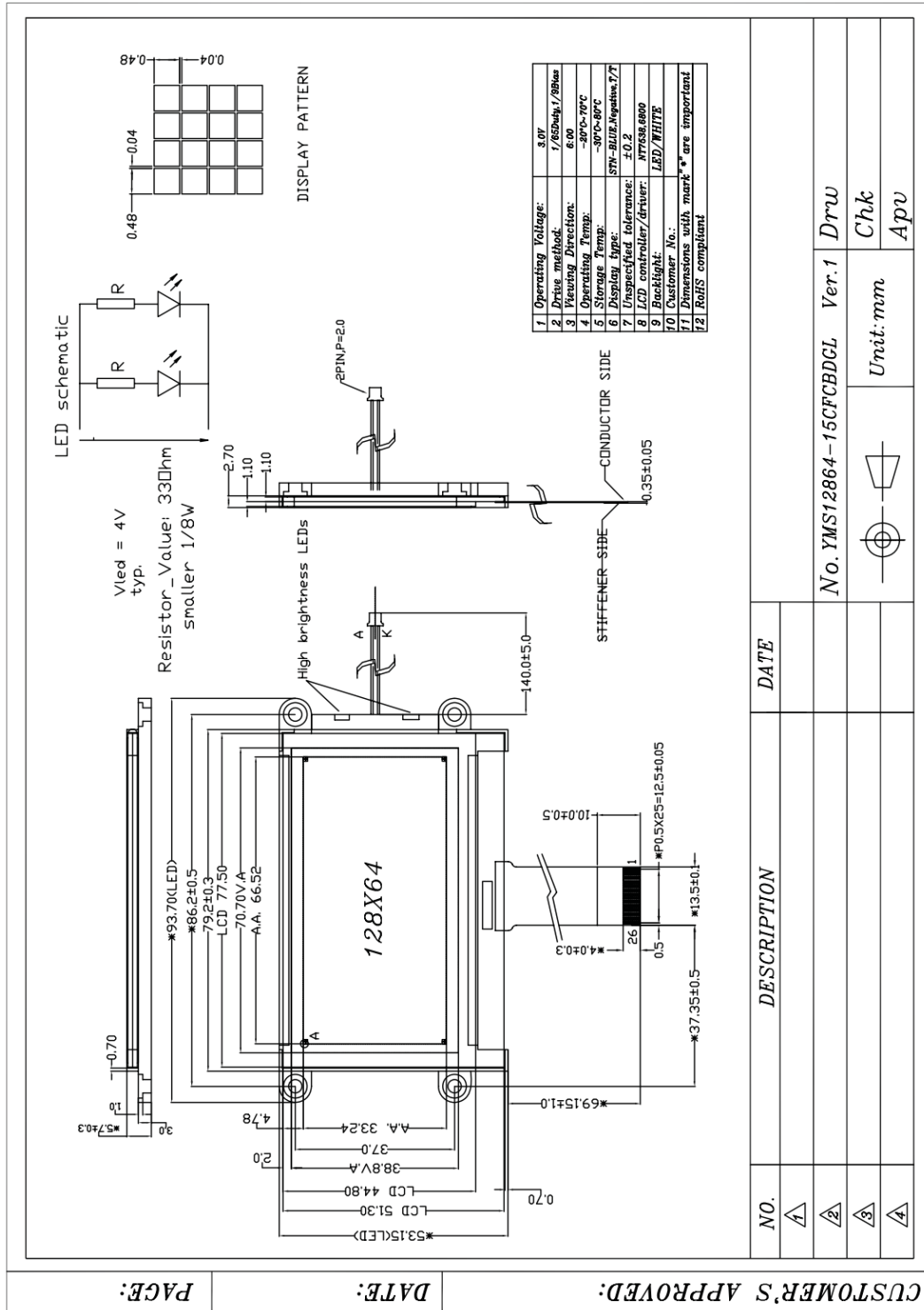
Standard of display test

No	Items	Criterion	Checking manner
1	Pin hole $D = (A+B)/2$ W: segment width	 $W \leq 0.4$ $D \leq 0.20$ And $D \leq 1/2W$ $N \leq 1$ $W > 0.4$ $D \leq 0.25$ And $D \leq 1/3W$ $N \leq 2$ $D \leq 0.05$ No check	Checking at the display state
2	Different width of segment	 $ a-b < 0.25$ or $ a-b \leq 1/4W$ No check	Checking at the display state

Note: d ~ Diameter n ~ Quantity Unit: mm

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 13 of 18

V.Attached Drawing



PAGE:

DATE:

CUSTOMER'S APPROVED:

NO.	DESCRIPTION	DATE
1		
2		
3		
4		

No. YMS12864-15CFBDGL Ver.1
Unit: mm
Drw
Chk
Apu

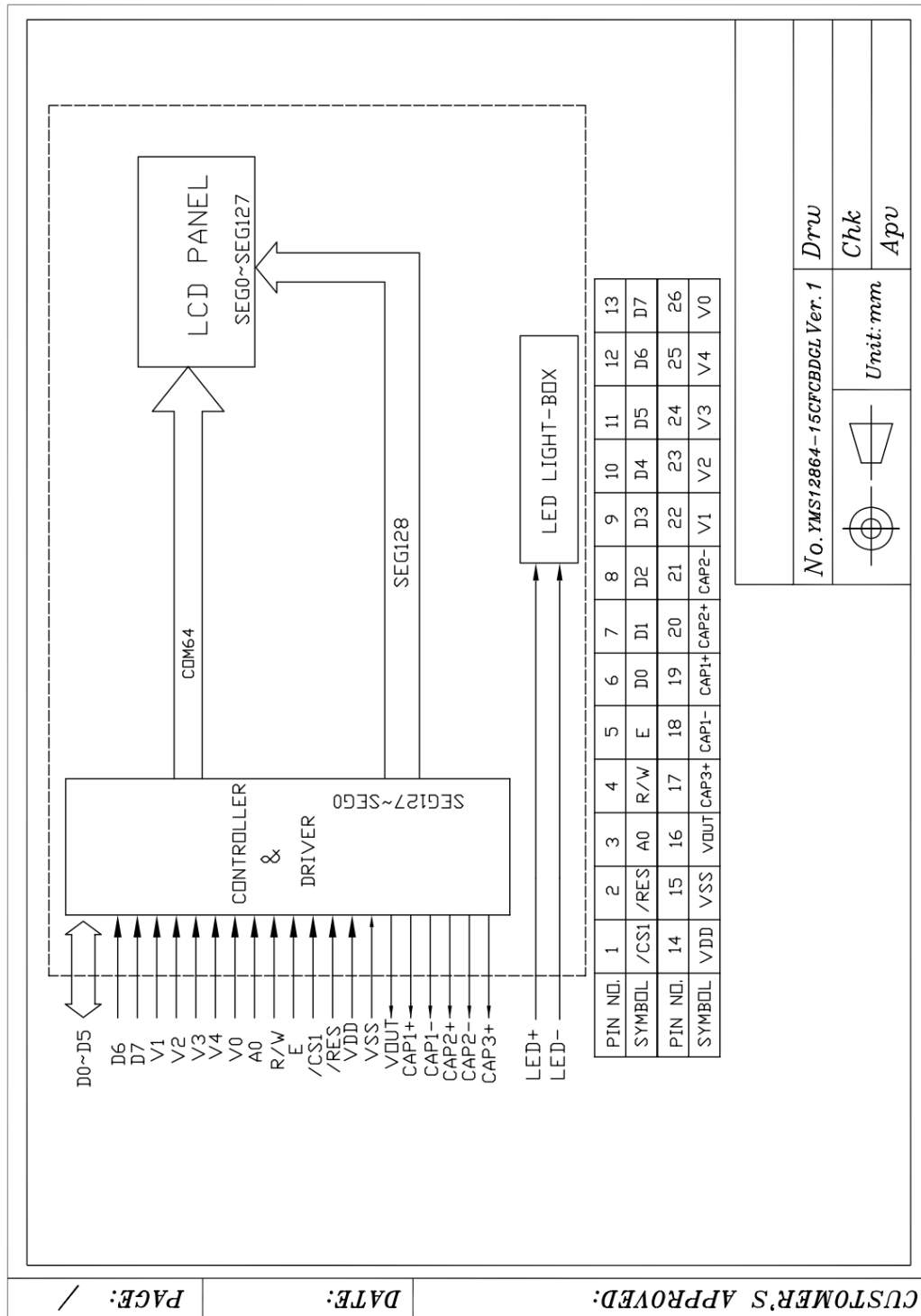
DATE SEP. 27.2011

LCM

YMS12864-15CFBDGL

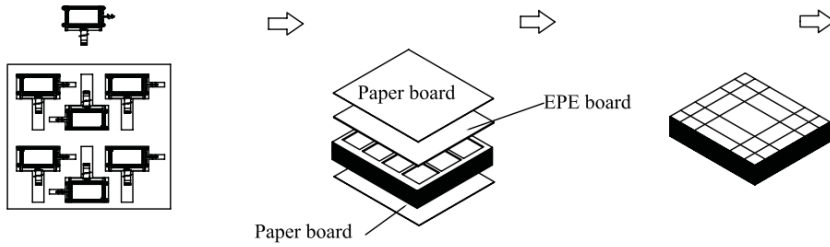
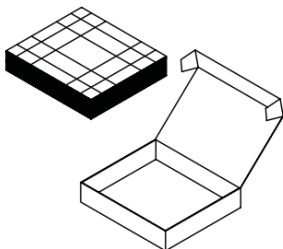
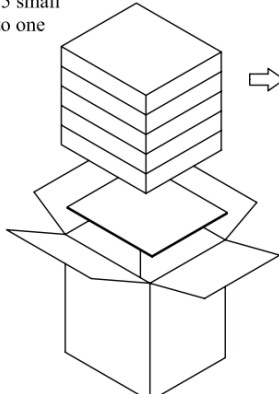
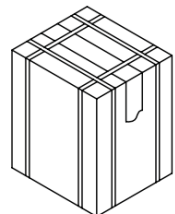
TECHNICAL SPECIFICATION

Page 14 of 18



DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 15 of 18

VI. Packing

<i>CUSTOMER'S APPROVED:</i>	DATE: 2011. 09. 28	<i>PAGE: 1 / 1</i>										
<p>PRODUCT PART NO.: YMS12864-15CFCBDGL</p> <p>PACKING TYPE: BY EPE TRAY(T12864-132A)</p> <p>PACKLING ORDER:</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 30%;"> <p>1) Putting 6 pcs Modules on each EPE tray.</p> </div> <div style="width: 30%;"> <p>2) Putting 7 pcs EPE trays together with EPE paper on the top of EPE tray.</p> </div> <div style="width: 30%;"> <p>3) Assembling the boards and the tray together with adhesive tape</p> </div> </div> <div style="text-align: center; margin: 10px 0;">  </div> <div style="display: flex; justify-content: space-around;"> <div style="width: 30%;"> <p>4) Putting in the inner small carton (TYPE:H82)</p>  </div> <div style="width: 30%;"> <p>5) Putting 5 small cartons into one outcarton</p>  </div> <div style="width: 30%;"> <p>6) Packing finished</p>  </div> </div> <p style="margin-top: 10px;">Note: 6 pcs in a tray, 7 trays in a inner carton, 5 inner cartons in a out carton, so 6x7x5=210pcs/Outcarton</p> <p style="margin-top: 5px;">Dimension (Small carton) : 385*325*87mm Dimension (Out carton) : 394*344*470mm</p>												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">NO. YMS12864-15CFCBDGL</td> <td style="width: 15%;">Ver. 1</td> <td style="width: 15%;">Drw:</td> <td style="width: 15%;">Chk:</td> <td style="width: 15%;">Apv:</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>			NO. YMS12864-15CFCBDGL	Ver. 1	Drw:	Chk:	Apv:					
NO. YMS12864-15CFCBDGL	Ver. 1	Drw:	Chk:	Apv:								

DATE SEP. 27.2011		TECHNICAL SPECIFICATION
LCM	YMS12864-15CFCBDGL	Page 16 of 18

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_0). Adjust V_0 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

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CF CBDGL	Page 17 of 18

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.

DATE SEP. 27.2011			TECHNICAL SPECIFICATION
LCM		YMS12864-15CFCBDGL	Page 18 of 18