



中显液晶
技术资料



型号ZX12864D

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1. GENERAL SPECIFICATIONS :

1-1 SCOPE:

This specification covers the delivery requirements for the liquid crystal display delivered by YAOYU TECHNOLOGY to Customer .

1-2 PRODUCTS:

Liquid Crystal Display Module (LCM)

1-3 MODULE NAME:

YMSC-G12864D-1DYSYWD

2.FEATURES

Item	Standard Value
Display Type	128 *64 dots
LCD Type	☐ FSTN, BLUE,Transmissive,Negative,Extened TEMP ☐ FSTN, Transflective,Positive,Extened TEMP ☐ STN, BLUE,Transmissive,Negative,Extened TEMP ☐ STN, GREY,Transflective,Positive,Extened TEMP ☒ STN, Yellow-GREEN,Positive,Extended TEMP
Drive Pattern	1/64 Duty, 1/9Bias
Viewing Direction	6 O'clock
Backlight Type	☐ YELLOW-GREEN LED BOTTOM BL ☒ YELLOW-GREEN SIDE LED BL ☐ CCFL WHITE BL
Weight	TBD
Interface	8-bit 6800/8080 MPU interface
Driver IC	KS0108B

3.MACHANICAL SPECIFICATIONS

ITEM	STANDARD VALUE	UNIT
DISPLAY FORMAT	128 X 64 DOTS	
MODULE DIMENSION	76.0(W) X 51.1(H) X 10.5(T)	mm
EFFECTTVE DISPLAY AREA	64.0(W) X33.0(H)	mm
DOT SIZE	0.44(W) X 0.44(H)	mm
DOT PITCH	0.48W) X 0.48 (H)	mm
LCD TYPE	YELLOW-GREEN, STN	
DUTY AND BIAS	1/64 DUTY; 1/9 BIAS	
VIEWING DIRECTION	6:00	
BACK LIGHT	YELLOW-GREEN SIDE LED	

4.ABSOLUTE MAXMIMUM RANGE

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY FOR LOGIC	VDD	Ta=25℃	-0.3	—	7.0	V
INPUT VOLTAGE	VIN	Ta=25℃	-0.3	—	VDD+0.3	V
Module OPERATION TEMPERATURE	TOPR	---	-10	—	+60	℃
Module STORAGE TEMPERATURE	TSTG	---	- 20	—	+70	℃
Storage Humidity	H _D	Ta < 40 ℃	-		90	%RH

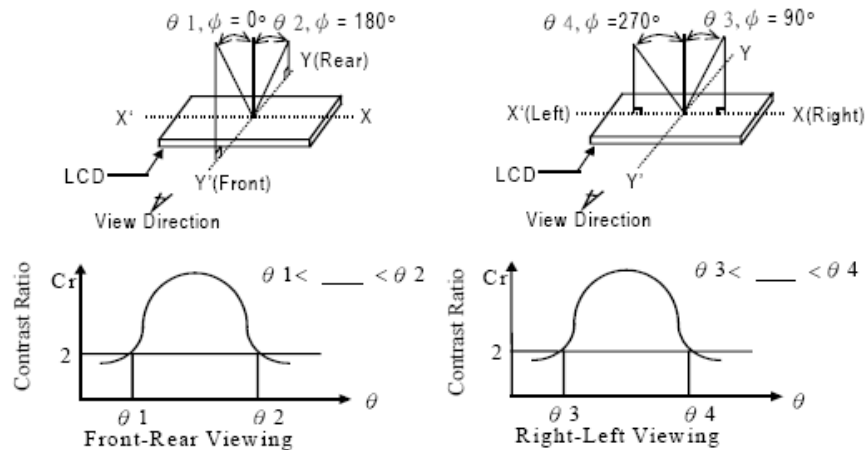
5.ELECTRICAL CHARATERISTICS

ITEM	SYMBOL	CONDITIO	MIN	TYP	MA	UN
	L	N			X	IT
Supply Voltage (logic)	Vdd-Vss	-	4.5	5	5.5	V
Supply Voltage (LCD)	Vlcd	Vdd=5V (25℃)	8.3	8.5	8.7	V
Input signal voltage	V-ih	“H” level	2.0	-	Vdd	V
	V-il	“L” level	0	-	0.8	V
Output signal voltage	V-oh	“H” level	2.4	-	Vdd	V
	V-ol	“H” level	0	-	0.4	V
Supply Current (logic)	Icc	-	-		1.2	mA
Supply Current (LCD)	Io	-	0.15	0.22	0.27	mA
Supply Voltage (LED)	V-bl	See note 1	2.1	2.2	2.3	V
Supply Current (LED)	I-bl	See note 1	-	100		mA

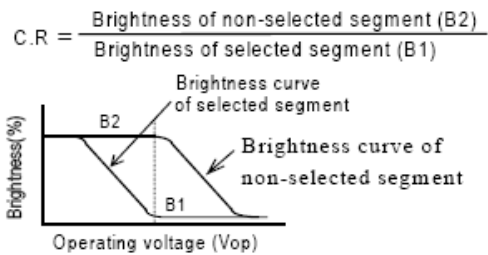
Note1:We have set some resisters between backlight and the backlight power supply ‘A’.

6.OPTICAL CHARACTERISITICS

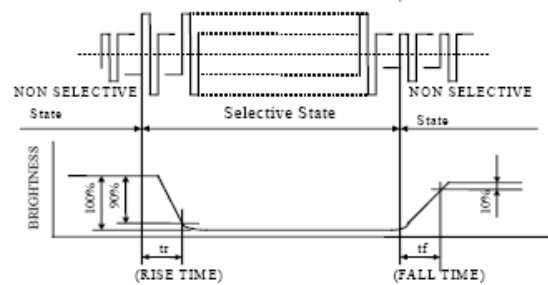
(1) DEFINITION OF VIEWING ANGLE



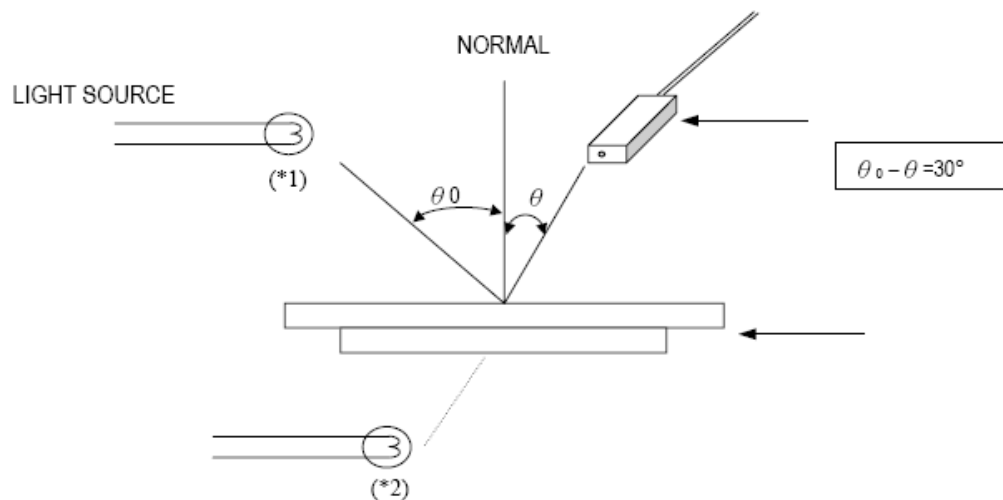
(2) DEFINITION OF CONTRAST



(3) DEFINITION OF RESPONSE



(4) Measuring Instruments For Electro-optical Characteristics



7.TIMING CHARACTERISITICS

1. Clock Timing

Characteristic	Symbol	Min	Typ	Max	Unit
CLK1, CLK2 Cycle Time	t_{CY}	2.5	-	20	μ s
CLK1 'LOW' Level Width	t_{WL1}	625	-	-	ns
CLK2 'LOW' Level Width	t_{WL2}	625	-	-	
CLK1 'HIGH' Level Width	t_{WH1}	1875	-	-	
CLK2 'HIGH' Level Width	t_{WH2}	1875	-	-	
CLK1-CLK2 Phase Difference	t_{D12}	625	-	-	
CLK2-CLK1 Phase Difference	t_{D21}	625	-	-	
CLK1, CLK2 Rise Time	t_R	-	-	150	
CLK1, CLK2 Fall Time	t_F	-	-	150	

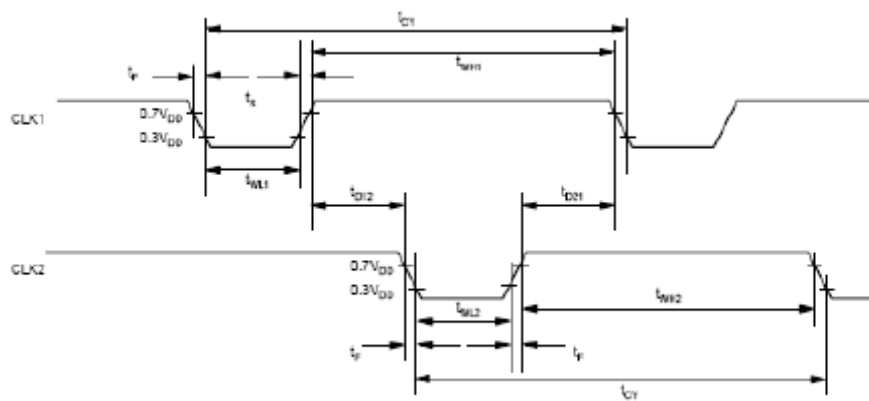


Fig4. External clock waveform

2. Display Control Timing

Characteristic	Symbol	Min	Typ	Max	Unit
FRM Delay Time	t_{DF}	-2	-	+2	μ s
MI Delay Time	t_{DI}	-2	-	+2	μ s
CL 'LOW' Level Width	t_{NL}	35	-	-	μ s
CL 'HIGH' Level Width	t_{NH}	35	-	-	μ s

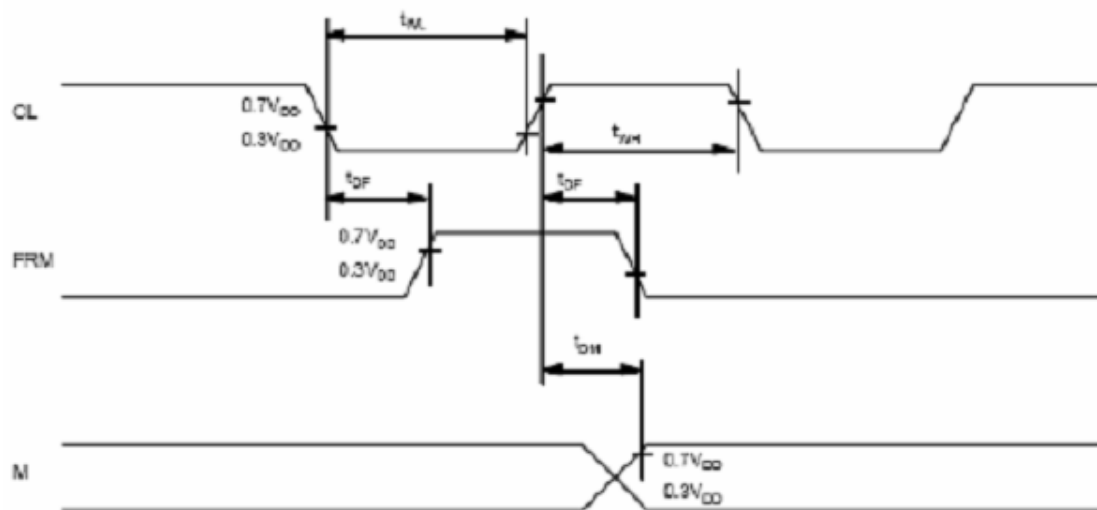


Fig 5. Display control signal waveform

3. MPU Interface

Characteristic	Symbol	Min	Typ	Max	Unit
E Cycle	t_c	1000	-	-	ns
E High Level Width	t_{WH}	450	-	-	ns
E Low Level Width	t_{WL}	450	-	-	ns
E Rise Time	t_R	-	-	25	ns
E Fall Time	t_F	-	-	25	ns
Address Set-Up Time	t_{ASU}	140	-	-	ns
Address Hold Time	t_{AH}	10	-	-	ns
Data Set-Up Time	t_{DSU}	200	-	-	ns
Data Delay Time	t_D	-	-	320	ns
Data Hold Time (Write)	t_{DHW}	10	-	-	ns
Data Hold Time (Read)	t_{DHR}	20	-	-	ns

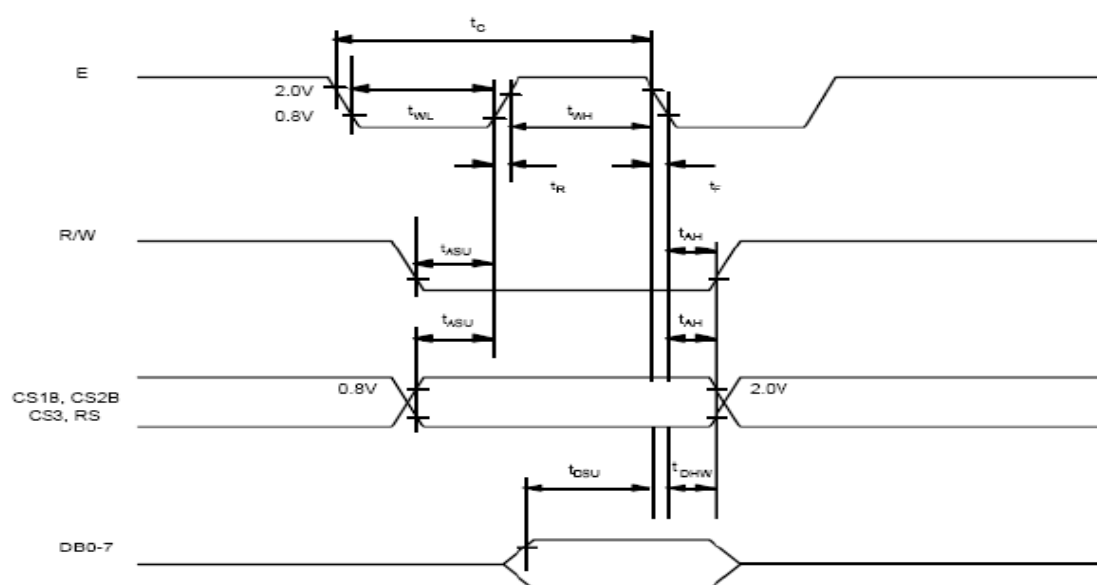


Fig 6. MPU write timing

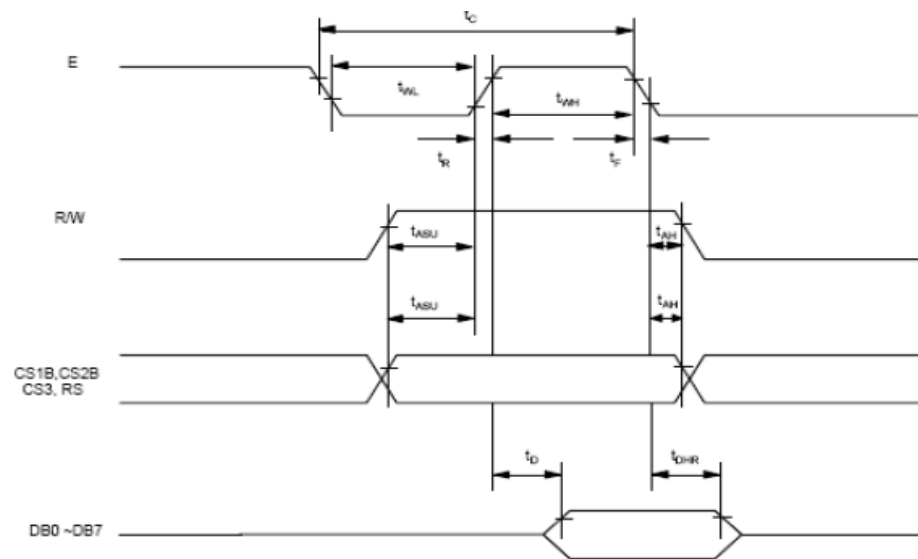
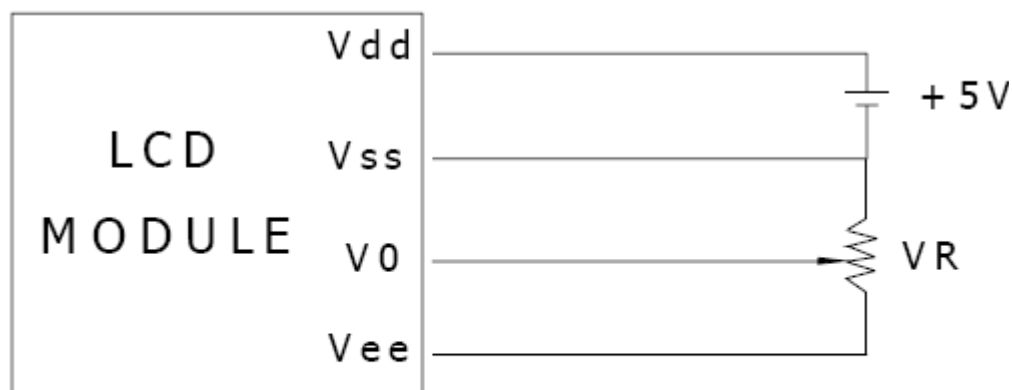
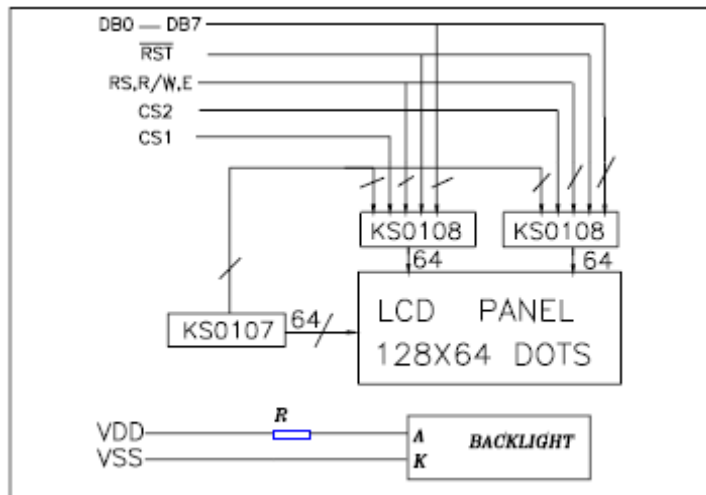


Fig 7. MPU Read timing

8.PIN ASSIGNMENT

PIN	SYMBOL	FUNCTION
1	Vss	Power Supply(GND)
2	Vdd	Power Supply(+5V)
3	Vo	Contrast Adjust
4	RS	H: Instruction register ; L: Data register
5	R/W	L: Write ; H: Read
6	E	Enable Signal
7-14	DB0-DB7	Data Bus
15	/CS1	Chip select for IC1.(H Active)
16	/CS2	Chip select for IC2.(H Active)
17	RESET	Reset signal
18	VEE	Negative Voltage Supply
19	K	Power Supply for LED B/L(-)
20	A	Power Supply for LED B/L(+)

9.BLOCK DIAGRAM

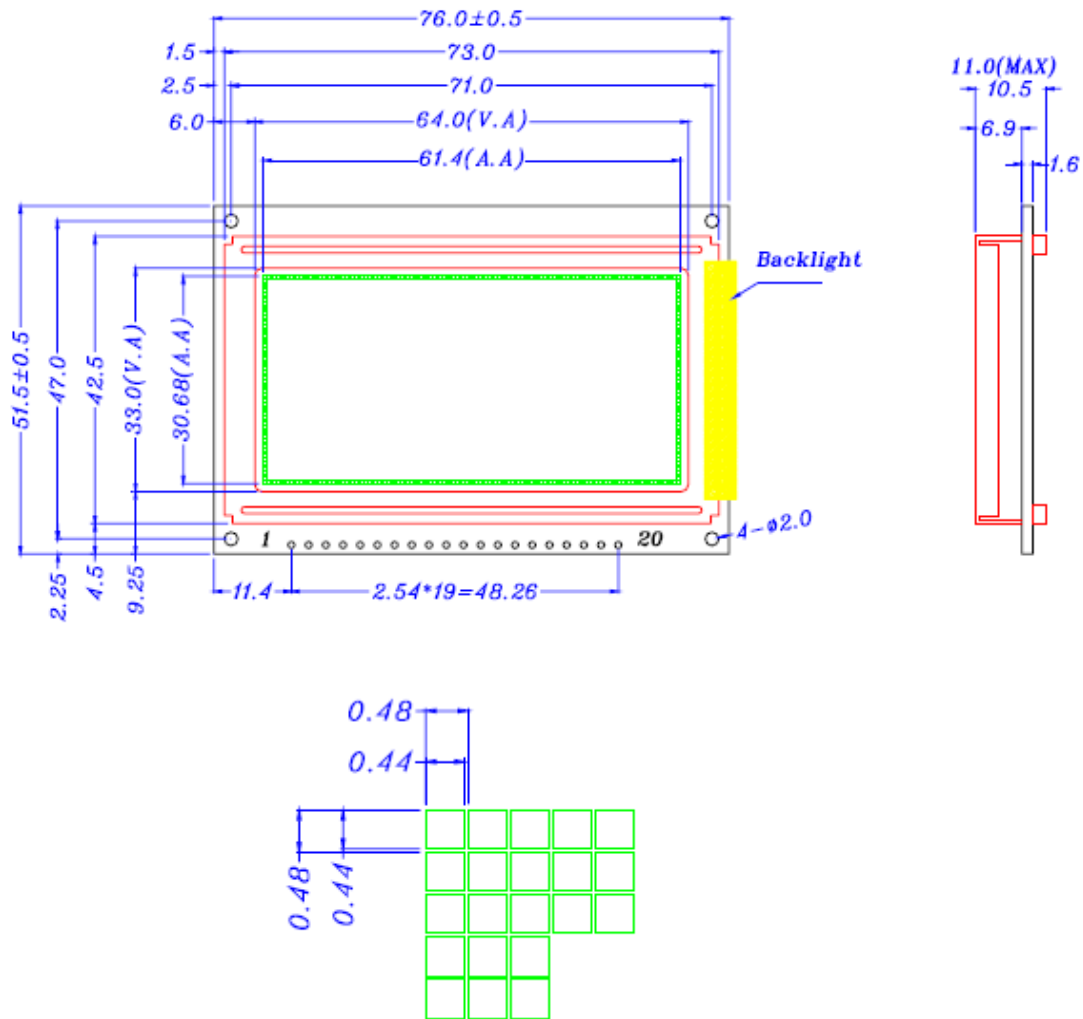


Vdd-V0: LCD Driving Voltage
VR: 10K - 20K

Display Control Instruction:

Please refer to the series of KS0108B.

10.OUTLINE DIMENSIONS



11.ENVIRONMENTAL ABSOLUTE MAXIMUM RRTINGS

ITEM	SYMBOL	CONDITIONS	CRITERION
OPERATING TEMPERATURE	TOPR	-20℃ ~ +70℃	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
STORAGE TEMPERATURE	TSTG	-30℃ ~ +80℃	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
HUMIDITY	—	See Note	WITHOUT CONDENSATION

12.RELIABILITY

ITEM	CONDITIONS	CRITERION
OPERATING TEMPERATURE	HIGH TEMPERATURE +70°C 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERATURE -20°C 240HRS	
STORAGE TEMPERATURE	HIGH TEMPERATURE +80°C 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERATURE -30°C 240HRS	
HUMIDITY	40°C 90%RH 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
VIBRATION	• Operating Time: thirty minutes exposure for each direction (X,Y,Z) • Sweep Frequency: 10~55Hz (1 min) • Amplitude: 1.5mm	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
THERMAL SHOCK	-20°C (30mins) $\leftrightarrow$ +70°C (30mins) 10 cycles	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION

*NOTE: TEST CONDITION

(1)TEMPERATURE AND HUMIDITY: IF NO SPECIFICATION, TEMP. SET AT $25\pm 2^{\circ}\text{C}$, HUMIDITY SET AT $60\pm 5\%\text{RH}$

(2) OPERATING STATE: SAMPLES SUBJECT TO THE TESTS SHALL BE IN "OPERATING" CONDITION

13.PRECAUTION FOR USE

The following precautions should be followed, since this module contains precise parts.

- (1) Do not store module for an extended periods of time under the conditions of high temperature and high humidity.
- (2) Avoid using or storing the module in areas that expose it to direct sunlight or ultraviolet rays.
- (3) Use protective finger covers when handling the module to avoid scratching or staining the module.
- (4) Care should be taken not to expose the module to static electricity, because the module contains C-MOS LSI's.
- (5) The LSI is sensitive to light.
The user's product should be designed so that LSI is not exposed to any light during operation.
- (6) During installation, cover the display area with acrylic protection plates to protect the polarizer plate and LCD cells.
- (7) Do not apply any excessive shocks to the module because the module contains sensitive LCD cells.
Do not use a module, which has experienced strong mechanical shock.
- (8) Care should be taken when the power supply turns on as following.
 - (a) Do not apply any input signals before the supplying voltage is applied.
 - (b) Do not turn off the power supply while any input signals are applied.

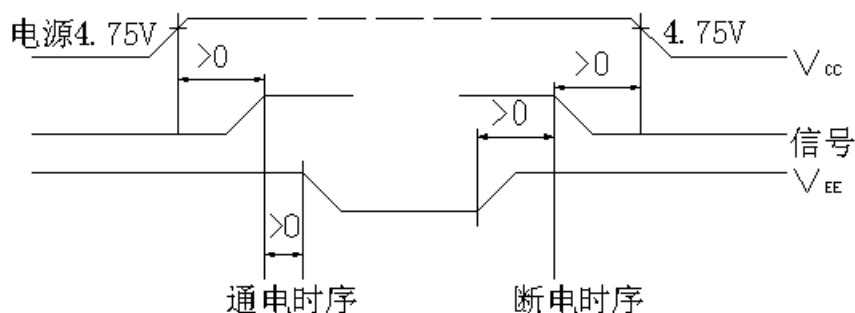
Caution

- (1) Dangerous. Do not shock glass because glass can break.
- (2) If module breaks, do not touch it directly.
(Glass could stick or cut skin.)
- (3) Do not swallow Liquid Crystal.
(In case of broken LCD panel, do not swallow liquid crystal even if there is no proof that liquid crystal is poisonous.)
- (4) If liquid crystal is exposed to skin, wash the area thoroughly with alcohol or soap.
- (5) When disposing of the product, please observe industrial waste disposal laws in each country and district.
- (6) In case of injury, give immediate treatment and consult with a doctor.
- (7) This product is constructed precisely. Don't disassemble or modify.

※ Neglecting this mark can cause injury to humans and damage to materials

液晶显示模块使用注意事项

1. 请勿随意自行加工、整修、拆卸。
2. 避免对液晶屏表面施加压力。
3. 不要用手随意去摸外引线、电路板上的电路及金属框。
4. 如必须直接接触时，应使人体与模块保持同一电位，或将人体良好接地。
5. 焊接使用的烙铁、操作用的电动改锥等工具必须良好接地，没漏电。
6. 严防各种静电。
7. 模块使用接入电源及断开电源时，必须按图时序进行。即必须在正电源（ $5 \pm 0.25V$ ）稳定接入后，才能输入信号电平。如在电源稳定接入前，或断开后就输入信号电平，将会损坏模块中的集成电路，使模块损坏。



8. 点阵模块在调节时，应调整 VEE 至最佳对比度、视角时为止。如果 VEE 调整过高，不仅会影响显示，还会缩短液晶的寿命。
9. 模块表面结雾时，不要通电工作，因为这将引起电极化学反应，产生断线。
10. 模块要存储在暗处（避阳光），温度在 $-10^{\circ}\text{C} \sim +35^{\circ}\text{C}$ ，湿度在 RH60%以上的地方。如能装入聚乙烯口袋（最好有防静电涂层）并将口封住最好。

以上使用说明由北京中显电子有限公司编制，有问题请电话联络，我们将竭诚为您服务，同时，提供完善的保修服务！因为每种液晶使用的控制器都不一样，控制器的型号基本就决定了液晶的指令形式和使用方式，所以，在说明书里一般不会详细照搬控制器说明书的每个细节，只会简要介绍常用指令，如果需要了解详细的指令和具体电气参数，请参照 WWW.ZXLCD.COM 网站里的“技术支持”菜单下，均有对应控制器手册免费下载，直接对应现有各类液晶使用的各种控制器，使用手册里一般有具体电气参数说明，指令详细介绍，同时辅以编程实例，以便客户详细参照，同时提高编程及操作技巧。

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