中显液晶
技术资料

型号ZX240128D

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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:

240128DDYSYWD

2. FEATURES：

2-1 MAIN LCD (LARGE)

Item	Standard Value
Display Type	240 *128dots
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	1/128 Duty, 1/12Bias
Viewing Direction	6 O'clock
Backlight Type	■YELLOW-GREEN LED BOTTOM BL □YELLOW-GREEN EDGE LED BL □CCFL WHITE BL
Weight	TBD
Interface	8-bit 6800 MPU interface
Driver IC	T6963C

3. MACHANICAL SPECIFICATIONS：

ITEM	STANDARD VALUE	UNIT
DISPLAY FORMAT	240 X 128 DOTS	
MODULE DIMENSION	145.0(W) X 68.0(H) X 12.0(T)	mm
EFFECTTVE DISPLAY AREA	93.56(W) X49.88(H)	mm
DOT SIZE	0.35(W) X 0.35(H)	mm
DOT PITCH	0.39W) X 0.39(H)	mm
LCD TYPE	YELOW-GREEN, STN	
DUTY AND BIAS	1/64DUTY; 1/9 BIAS	
VIEWING DIRECTION	6:00	
BACK LIGHT	YELLOW-GREEN LED BOTTOM	

4. ABSOLUTE MAXIMUM RATING

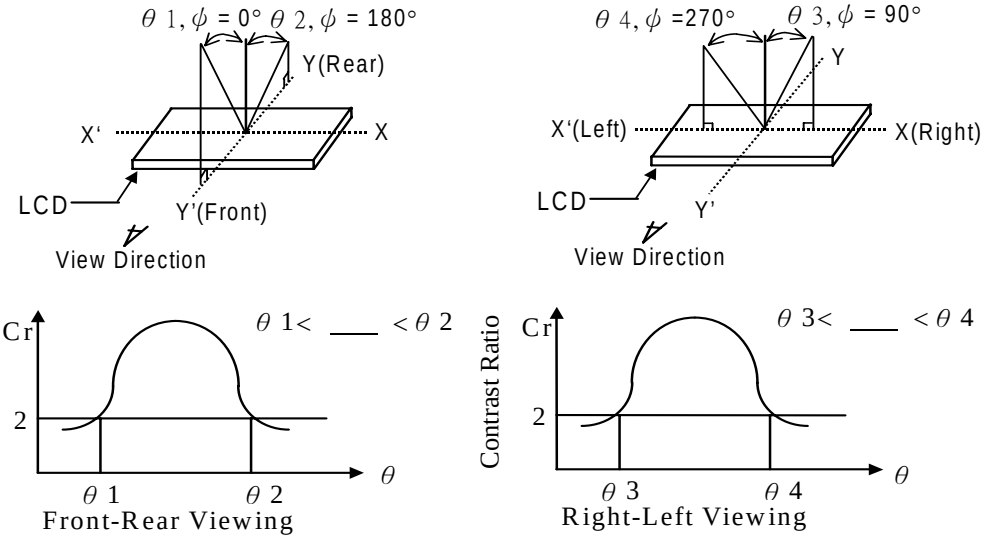
ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY FOR LOGIC	VDD	Ta=25℃	-0.3	—	+7.0	V
INPUT VOLTAGE	VIN	Ta=25℃	-0.3	—	Vdd+0.3	V
Module OPERATION TEMPERATURE	TOPR	---	-20	—	+70	℃
Module STORAGE TEMPERATURE	TSTG	---	- 30	—	+80	℃
Storage Humidity	H_D	Ta < 40 °C	-		90	%RH

5. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage (logic)	Vdd-Vss	-	4.8	5	5.2	V
Supply Voltage (LCD)	Vlcd	Vdd=5V (25°C)	-	16.5	-	V
Input signal voltage	V-ih	"H" level	0.8Vdd	-	Vdd	V
	V-il	"L" level	0	-	0.2VDD	V
Output signal voltage	V-oh	IOH=-0.5mA	0.8VDD	-	VDD	V
	V-ol	IOL=0.5mA	VSS	-	-0.2VDD	V
Supply Current (logic)	Icc	-	-	10	18	mA
Supply Current (LCD)	Io	-	-	-	-	mA
Supply Voltage (LED)	V-bl	-	-	4.1	-	V
Supply Current (LED)	I-bl	-	-	160		mA

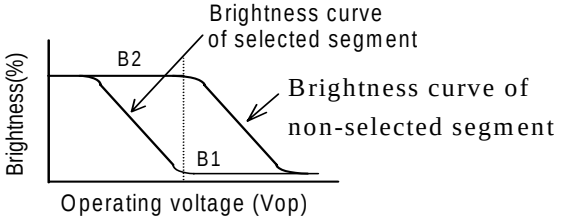
6.OPTICAL CHARACTERISTICS

(1) DEFINITION OF VIEWING ANGLE

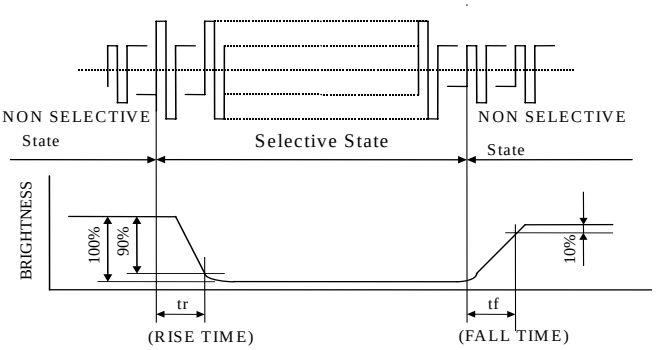


(2) DEFINITION OF CONTRAST

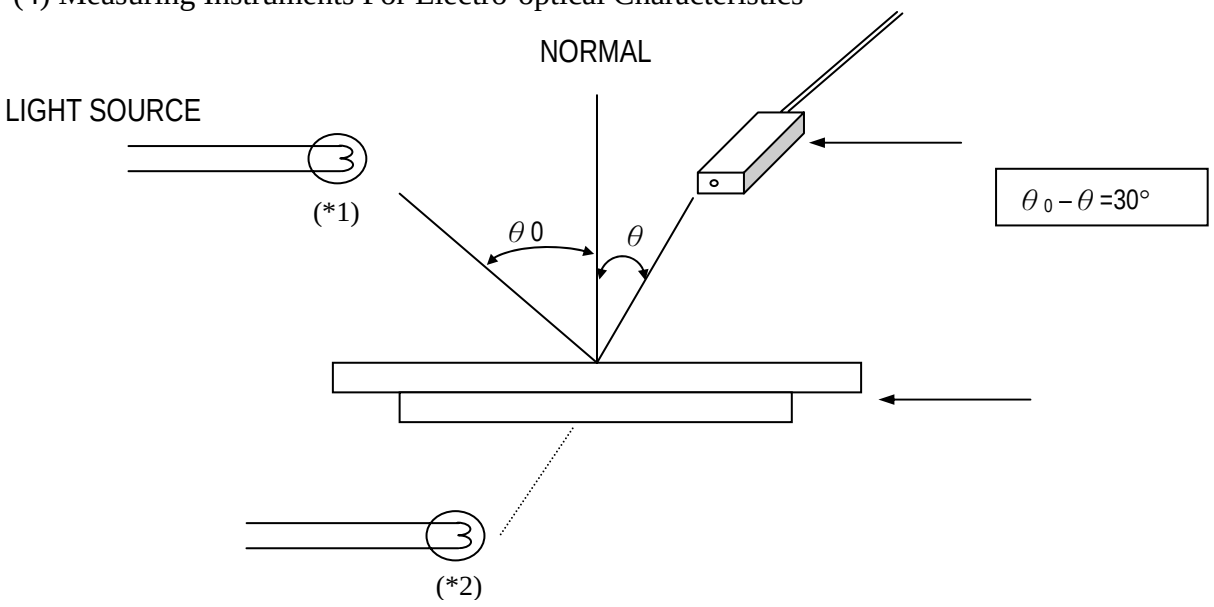
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



(3) DEFINITION OF RESPONSE



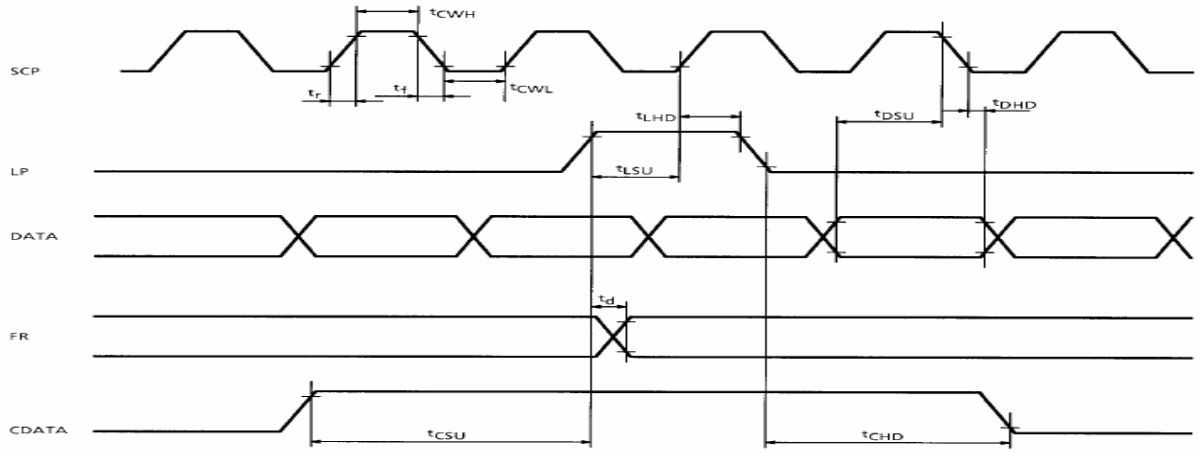
(4) Measuring Instruments For Electro-optical Characteristics



7.0 .TIMING CHARACTERISTICS

Ac Characteristics

- **Switching Characteristics (1)**

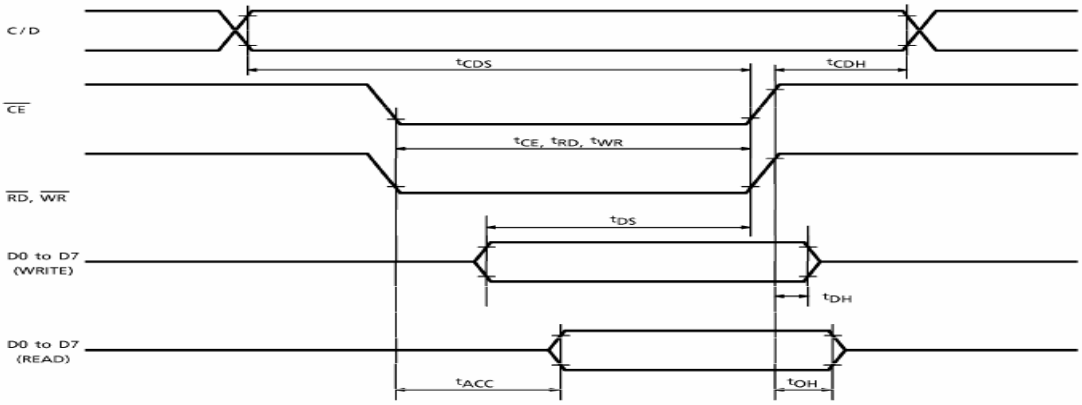


Test Conditions (Unless Otherwise Noted, V_{DD} = 5.0 V ± 10%, V_{SS} = 0 V, Ta = −20 to 70°C)

Item	Symbol	Test Conditions	Min	Max	Unit
Operating Frequency	f_{SCP}	Ta = −10~70°C	—	2.75	MHz
SCP Pulse Width	t_{CWH}, t_{CWL}	—	150	—	ns
SCP Rise / Fall Time	t_r, t_f	—	—	30	ns
LP Set−up Time	t_{LSU}	—	150	290	ns
LP Hold Time	t_{LHD}	—	5	40	ns
Data Set−up Time	t_{DSU}	—	170	—	ns
Data Hold Time	t_{DHD}	—	80	—	ns
FR Delay Time	t_d	—	0	90	ns
CDATA Set−up Time	t_{CSU}	—	450	850	ns
CDATA Hold Time	t_{CHD}	—	450	950	ns

- **Switching Characteristics (2)**

  Bus Timing

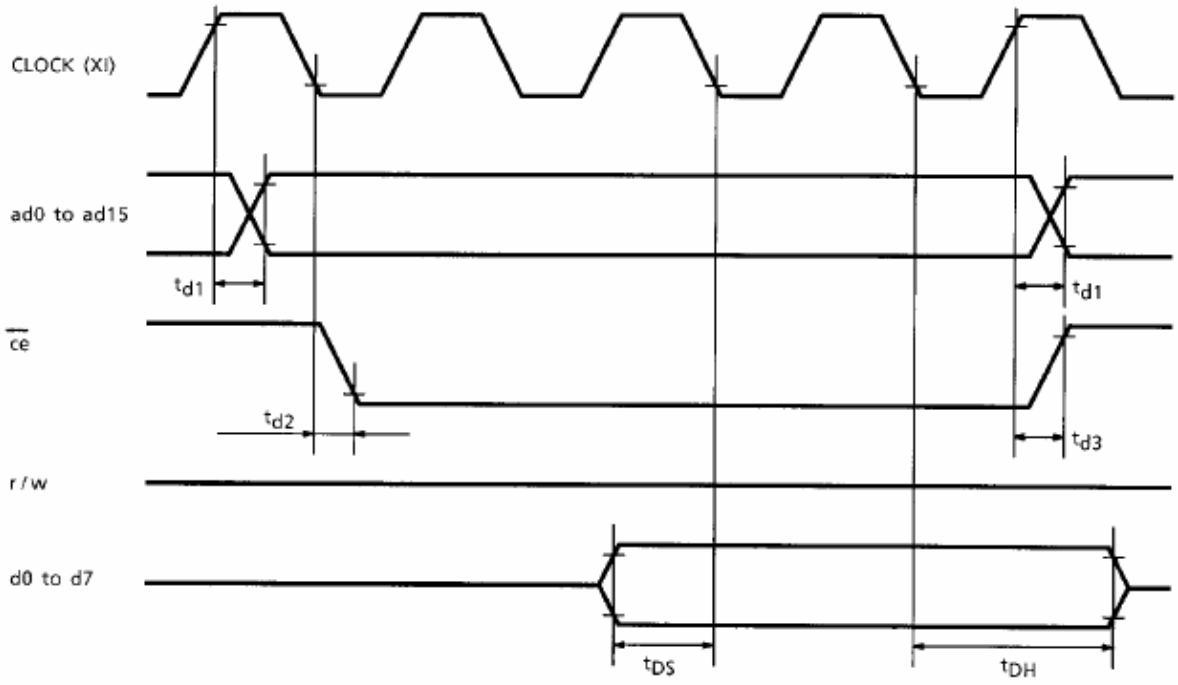


TEST CONDITIONS (Unless otherwise noted, V_{DD} = 5.0V ± 10%, V_{SS} = 0V, Ta = − 20 to 75°C)

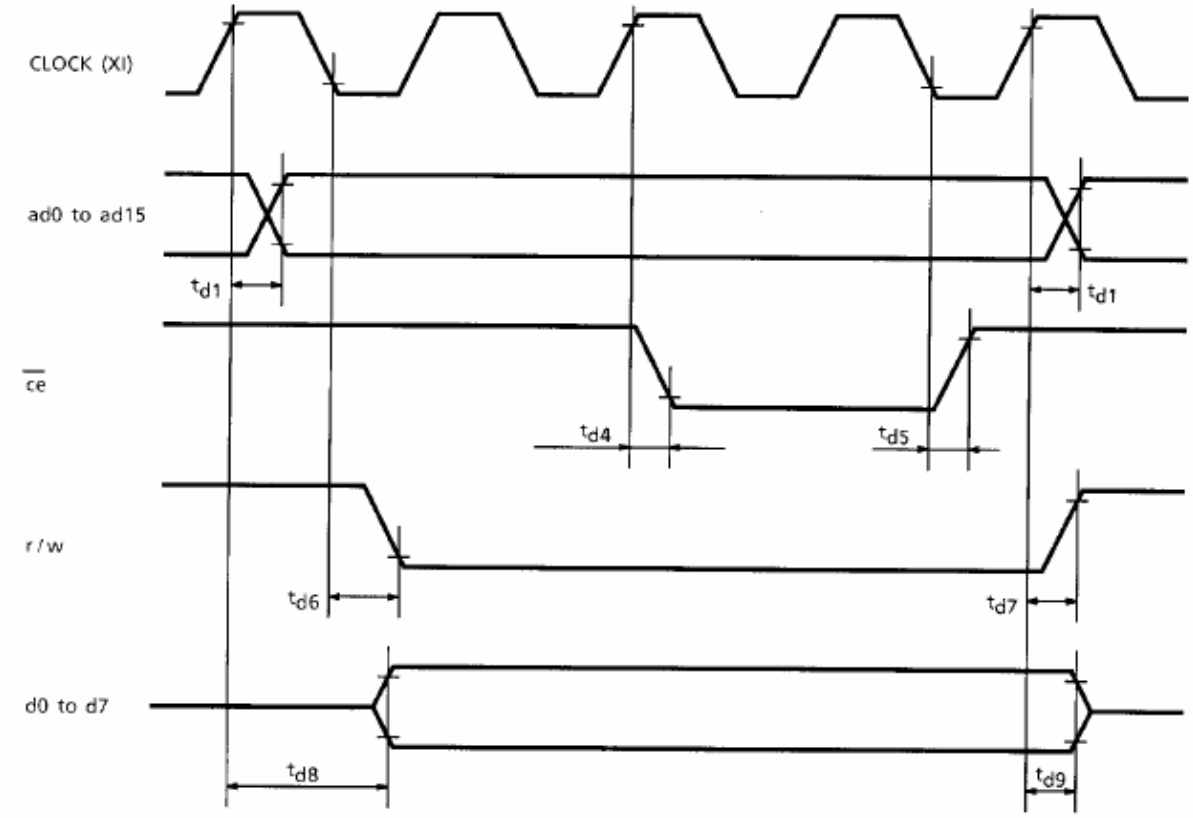
ITEM	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
C/D Set-up Time	t_{CDS}	—	100	—	ns
C/D Hold Time	t_{CDH}	—	10	—	ns
$\overline{CE}$, $\overline{RD}$, $\overline{WR}$ Pulse Width	t_{CE}, t_{RD}, t_{WR}	—	80	—	ns
Data Set-up Time	t_{DS}	—	80	—	ns
Data Hold Time	t_{DH}	—	40	—	ns
Access Time	t_{ACC}	—	—	150	ns
Output Hold Time	t_{OH}	—	10	50	ns

- **Switching Characteristics (3)**

(1) External RAM Read mode



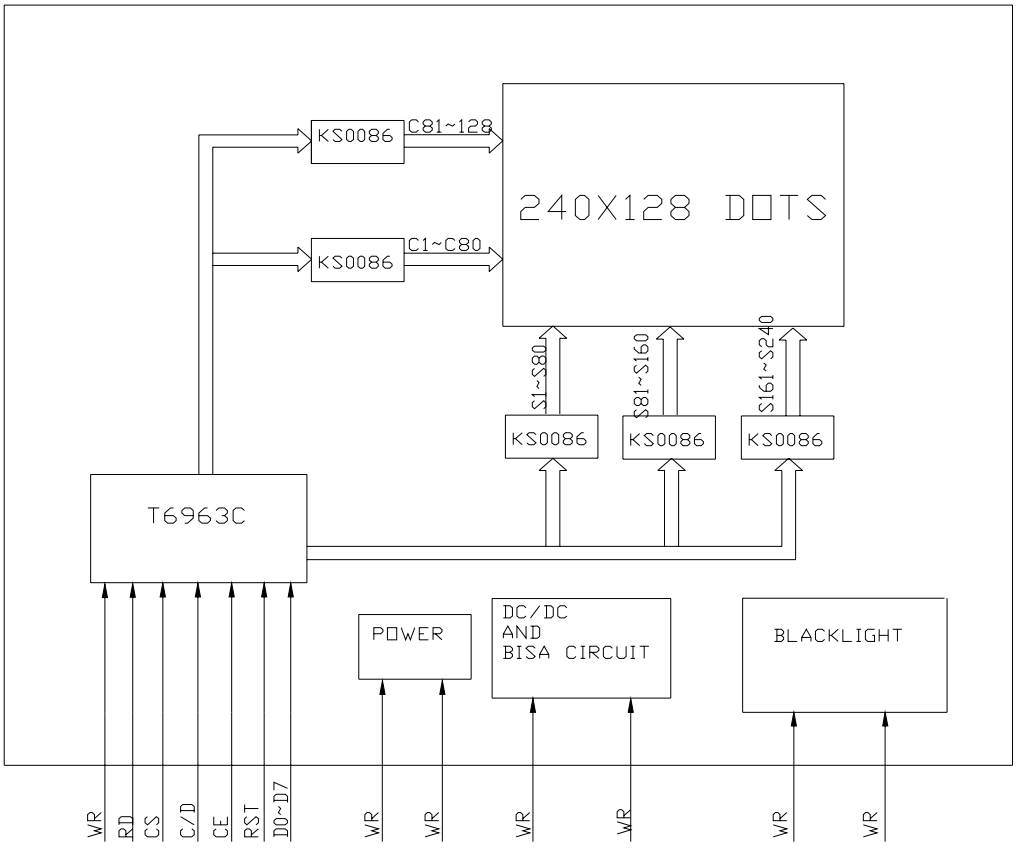
(2) External RAM Write mode

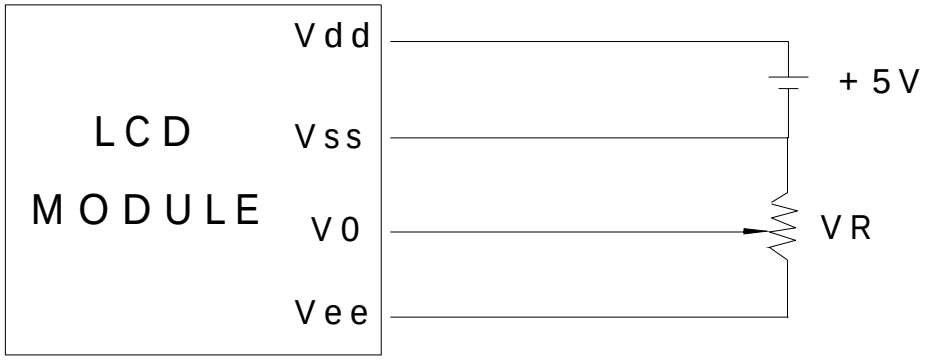


8. PIN ASSIGNMENT

PIN	SYMBOL	FUNCTION
1	VSS	POWER Ground
2	VDD	SUPPLY LOGIC VOLTAGE +5V
3	V0	POWER SUPPLEY FOR LCD DRIVER
4	C/D	Register select. H: Data code input; L: instruction code input.
5	RD	Data Read.Read data from t6963c when RD=L
6	WR	Data Write.Write data into t6963c when WR=L
7~14	D0~D7	Data bus
15	CE	USED AS READ/WRITE ENABLE SIGNAL
16	RST	SYSTEM RESET TERMINAL
17	VOUT(VEE)	DC/DC Voltage output
18	FS	Pins for selection of font.
19	A	POWER SUPPLY FOR BACKLIGHT +5V
20	K	POWER SUPPLY FOR BACKLIGHT 0V

9. BLOCK DIAGRAM





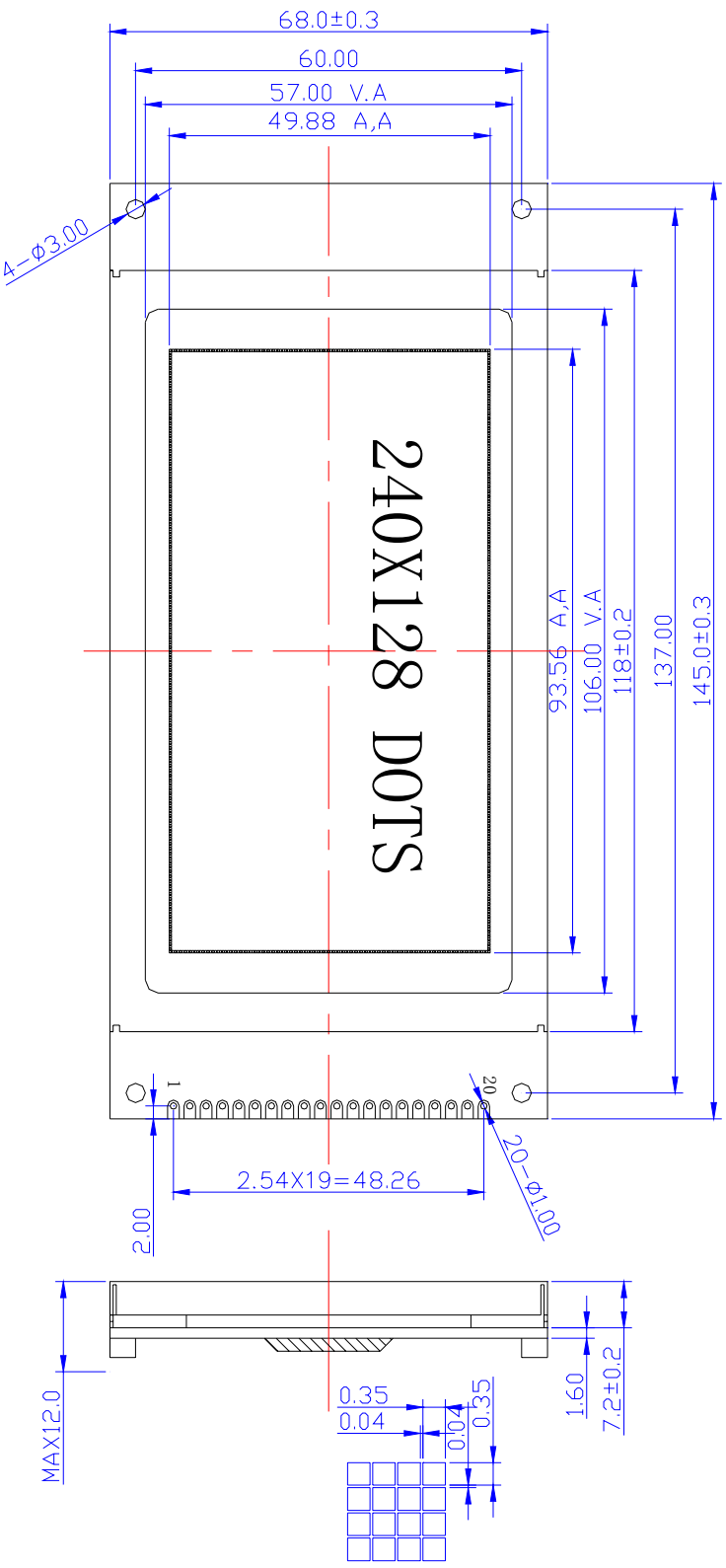
Vdd-V0: LCD Driving Voltage
VR: 10K - 20K

Display Control Instruction:

Please refer to the series of T6963C.

10.OUTLINE DIMENSIONS

1	VSS
2	VDD
3	V0
4	C/D
5	RD
6	WR
7	D0
8	D1
9	D2
10	D3
11	D4
12	D5
13	D6
14	D7
15	CE
16	RST
17	VOUT
18	FS
19	A
20	K



11. ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

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.RELIABITY

12-1 RELIABILITY TEST

ITEM	CONDITIONS	CRITERION
OPERATING TEMPERATURE	HIGH TEMPERTURE +70℃ 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERTURE -20℃ 240HRS	
STORAGE TEMPERATURE	HIGH TEMPERTURE +80℃ 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERTURE - 30℃ 240HRS	
HUMIDITY	40℃ 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℃(30mins) ←→+70℃(30mins) 10 cycles	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION

*NOTE: TEST CONDITION

(1)TEMPERATURE AND HUMIDITY: IF NO SPECIFICATION, TEMP. SET AT 25±2℃, HUMIDITY SET AT 60±5%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.

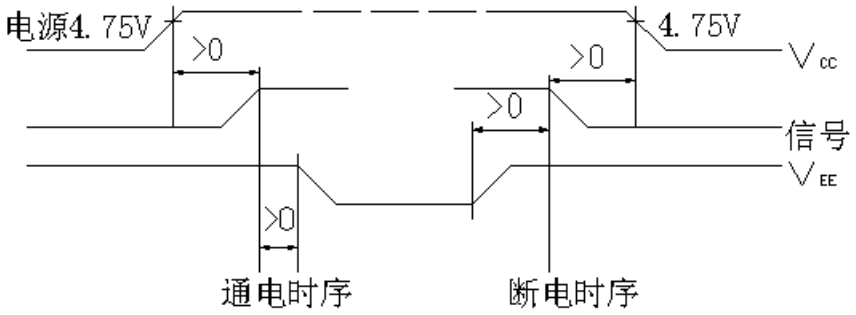
(6) In case of injury, give immediate treatment and consult with a doctor.

(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 ±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℃～+35℃，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。

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