



# SPECIFICATIONS

SAMPLE CODE : <u>YMSP-G128128B-1DYLYSD</u>
REVISION. : <u>1.00</u>
<b>Customer Approved</b>
DATE:

SHENZHEN YAOYU TECHNOLOGY CO.,LTD			
Sales Sign	QC Confirmed	Checked By	Designer
			Lwj

- Approval For Specifications Only.
- Approval For Specifications and Sample.

深圳市耀宇科技有限公司





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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:

**YMSP-G128128B-1DYLYSD**

## 2. FEATURES :

### 2-1 MAIN LCD (LARGE)

Item	Standard Value
Display Type	128 *128 dots
LCD Type	<input type="checkbox"/> FSTN, BLUE,Transmissive,Negative,Extended TEMP <input type="checkbox"/> FSTN, Transflective,Positive,Extended TEMP <input type="checkbox"/> STN, BLUE,Transmissive,Negative,Extended TEMP <input type="checkbox"/> STN, GREY,Transflective,Positive,Extended TEMP <input checked="" type="checkbox"/> STN, Yellow-GREEN,Positive,Extended TEMP
Drive Pattern	1/128 Duty, 1/12Bias
Viewing Direction	6 O'clock
Backlight Type	<input checked="" type="checkbox"/> YELLOW-GREEN LED BOTTOM BL <input type="checkbox"/> WHITE EDGE LED BL <input type="checkbox"/> CCFL WHITE BL
Weight	TBD
Interface	8-bit 6800/8080 MPU interface
Driver IC	T6963C

### 3. MACHANICAL SPECIFICATIONS :

ITEM	STANDARD VALUE	UNIT
DISPLAY FORMAT	240 X 64 DOTS	
MODULE DIMENSION	92.0(W)X106.8(H)X 17.0(MAX)	mm
EFFECTTVE DISPLAY AREA	70.35(W) X70.35(H)	mm
DOT SIZE	0.5(W) X 0.5(H)	mm
DOT PITCH	0.55W) X 0.55(H)	mm
LCD TYPE	YELLOW-GREEN, STN	
DUTY AND BIAS	1/128 DUTY; 1/12 BIAS	
VIEWING DIRECTION	6:00	
BACK LIGHT	YELLOW-GREEN	

### 4. ABSOLUTE MAXIMUM RATING

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

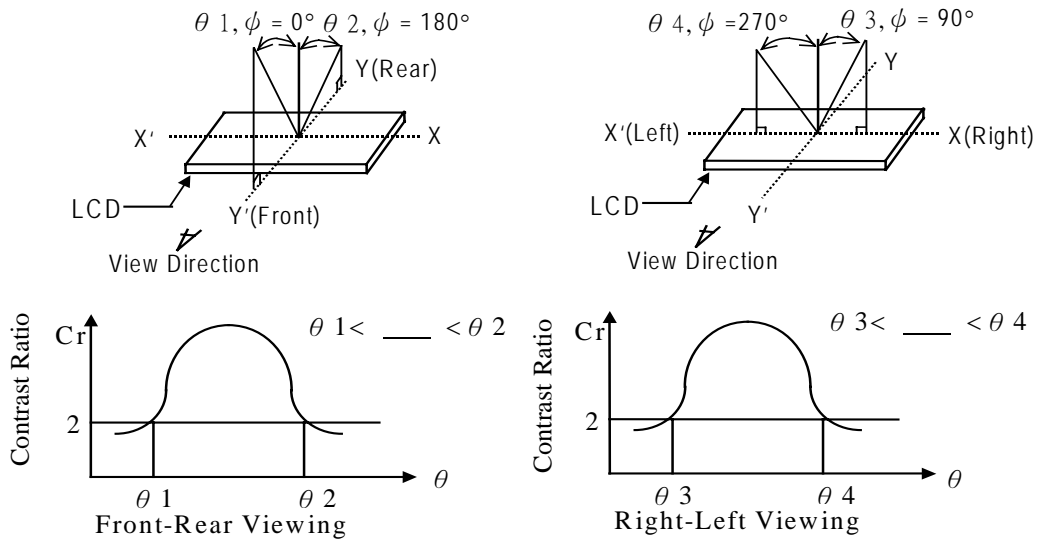
### 5. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage (logic)	Vdd-Vss	-	4.5	5	5.5	V
Supply Voltage (LCD)	Vlcd	Vdd=5V (25°C)	17	17.5	18	V
Input signal voltage	V-ih	“H” level	Vdd-2.2	-	Vdd	V
	V-il	“L” level	0	-	0.8	V
Output signal voltage	V-oh	“H” level	Vdd-0.3	-	Vdd	V
	V-ol	“H” level	0	-	0.3	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	4	4.2	4.5	V
Supply Current (LED )	I-bl	See note 1	150	-	250	mA

Note 1: We have set some resistors between the backlight and the backlight power supply “A”.

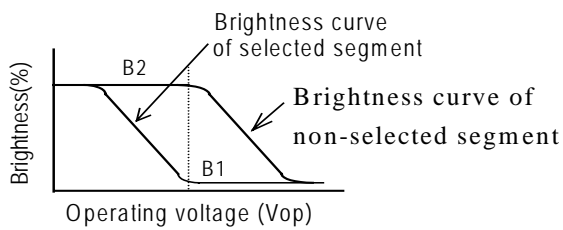
## 6. OPTICAL CHARACTERISTICS

### (1) DEFINITION OF VIEWING ANGLE

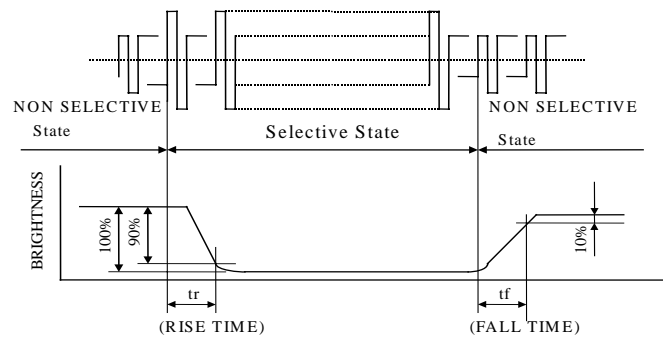


### (2) DEFINITION OF CONTRAST

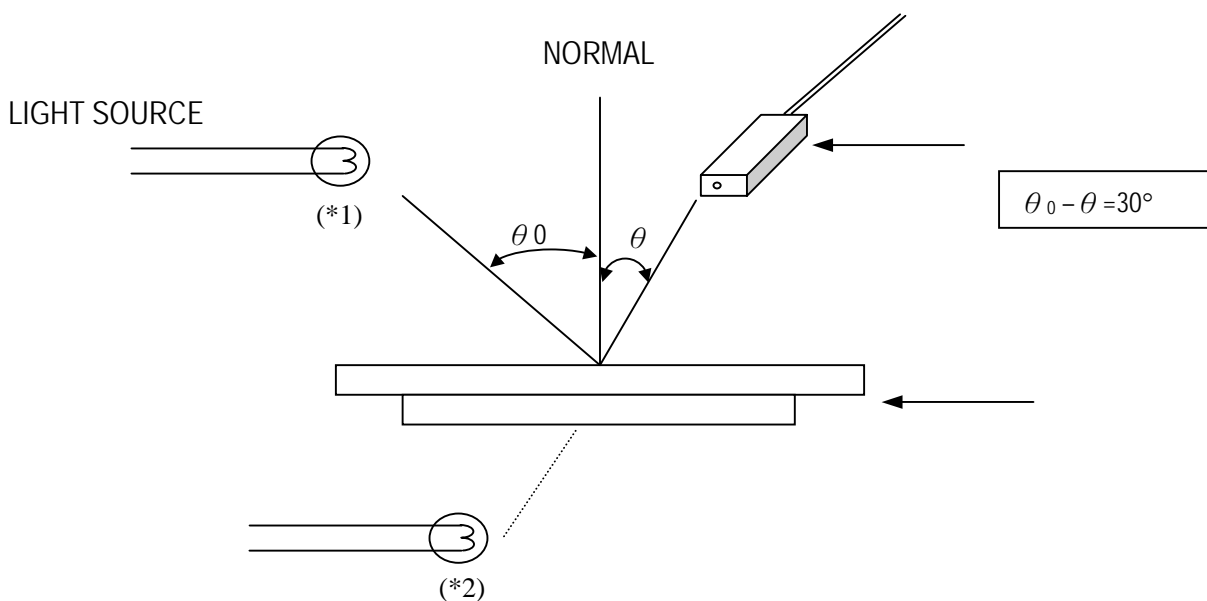
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



### (3) DEFINITION OF RESPONSE



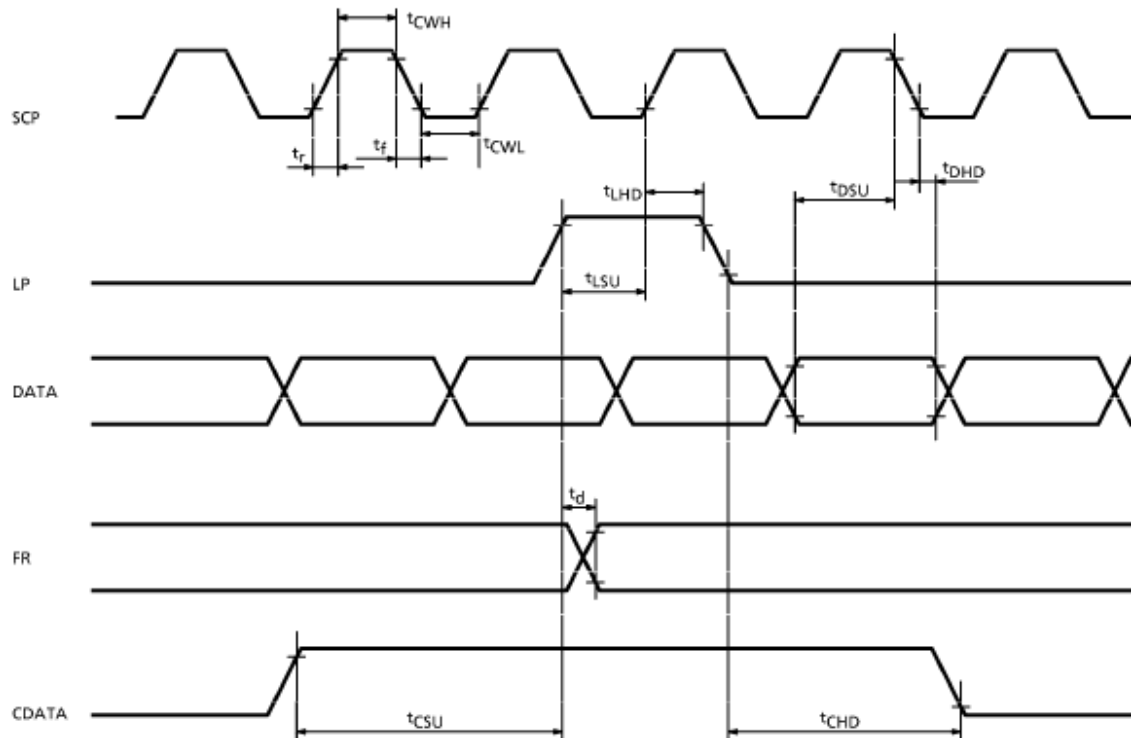
### (4) Measuring Instruments For Electro-optical Characteristics



## 7.0 .TIMING CHARACTERISTICS

### AC CHARACTERISTICS

- Switching Characteristics (1)

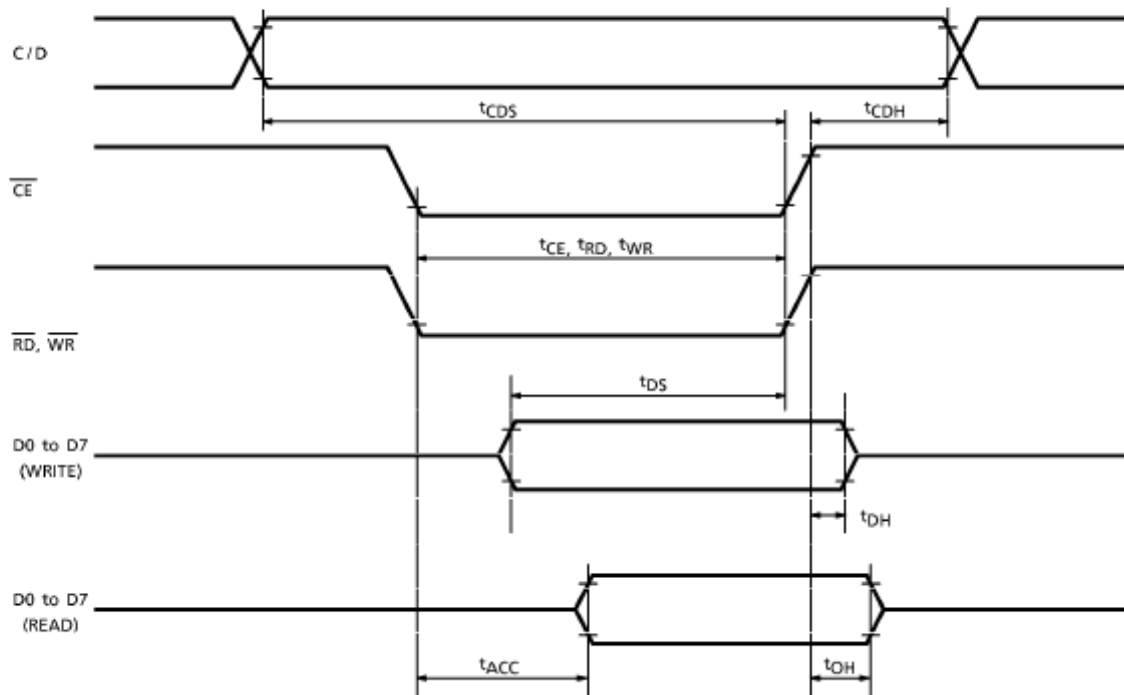


TEST CONDITIONS (Unless otherwise noted,  $V_{DD} = 5.0V \pm 10\%$ ,  $V_{SS} = 0V$ ,  $T_a = -20$  to  $70^\circ C$ )

ITEM	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Operating Frequency	$f_{SCP}$	$T_a = -10 \sim 70^\circ C$	—	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

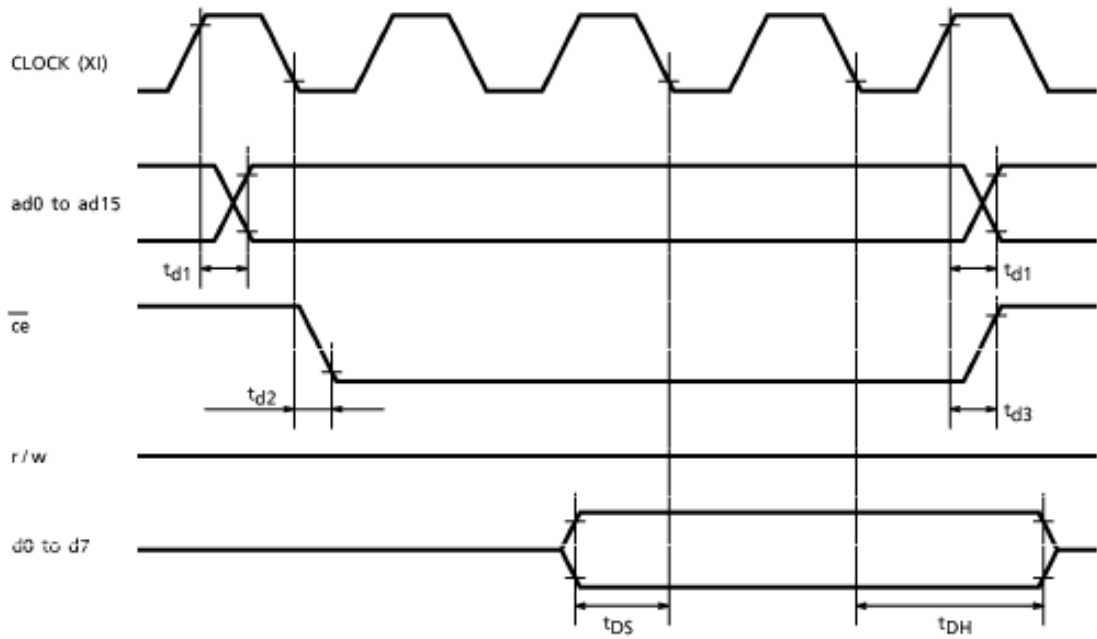


TEST CONDITIONS (Unless otherwise noted,  $V_{DD} = 5.0V \pm 10\%$ ,  $V_{SS} = 0V$ ,  $T_a = -20$  to  $75^\circ C$ )

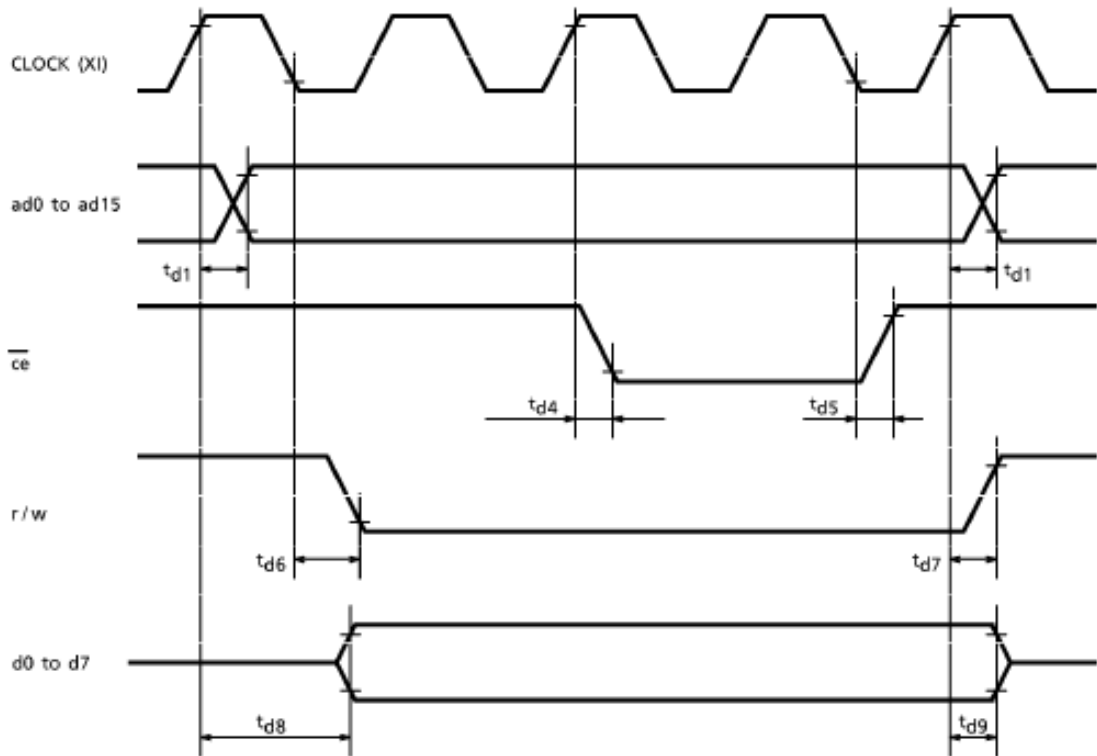
ITEM	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
C/D Set-up Time	$t_{CDS}$	—	100	—	ns
C/D Hold Time	$t_{CDH}$	—	10	—	ns
CE, RD, WR Pulse Width	$t_{CE}, t_{RD}, t_{WR}$	—	80	—	ns
Data Set-up Time	$t_{DS}$	—	80	—	ns
Data Hold Time	$t_{DH}$	—	40	—	ns
Access Time	$t_{ACC}$	—	—	150	ns
Output Hold Time	$t_{OH}$	—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

● Switching Characteristics (3)

(1) External RAM Read mode



(2) External RAM Write mode



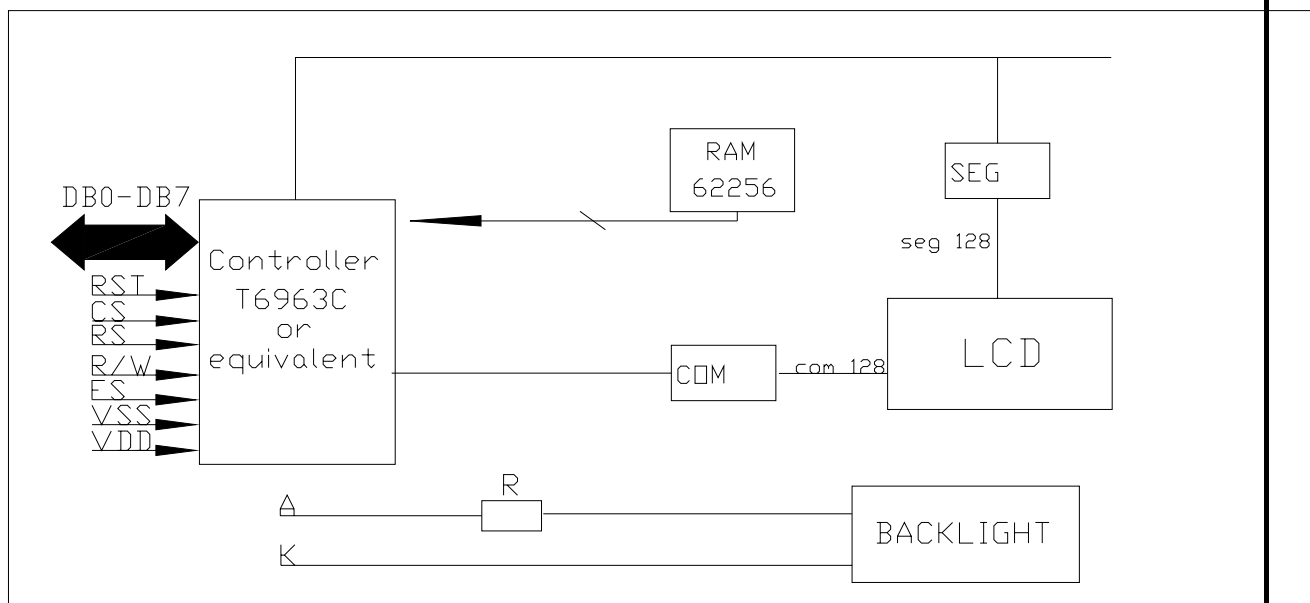
TEST CONDITIONS (Unless otherwise noted,  $V_{DD} = 5.0V \pm 10\%$ ,  $V_{SS} = 0V$ ,  $T_a = -20$  to  $70^{\circ}C$ )

ITEM	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Address Delay Time	$t_{d1}$	—	—	250	ns
ce Fall Delay Time (Read)	$t_{d2}$	—	—	180	ns
ce Rise Delay Time (Read)	$t_{d3}$	—	—	180	ns
Data Set-up Time	$t_{DS}$	—	0	—	ns
Data Hold Time	$t_{DH}$	—	30	—	ns
ce Fall Delay Time (Write)	$t_{d4}$	—	—	200	ns
ce Rise Delay Time (Write)	$t_{d5}$	—	—	200	ns
r/w Fall Delay Time	$t_{d6}$	—	—	180	ns
r/w Rise Delay Time	$t_{d7}$	—	—	180	ns
Data Stable Time	$t_{d8}$	—	—	450	ns
Data Hold Time	$t_{d9}$	—	—	200	ns

## 8. PIN ASSIGNMENT

PIN	SYMBOL	FUNCTION
1	FG	Frame Ground
2	Vss	Power Supply(GND)
3	Vdd	Power Supply(+5V)
4	Vo	Negative power
5	WR	Write.
6	RD	Read.
7	CS	Chip select for IC.
8	RS	H: Instruction register ; L: Data register
9	RESET	Reset signal
10-17	DB0-DB7	Data Bus
18	FS	Font type select.
19	A	BACKLIGH +
20	K	BACKLIGH -

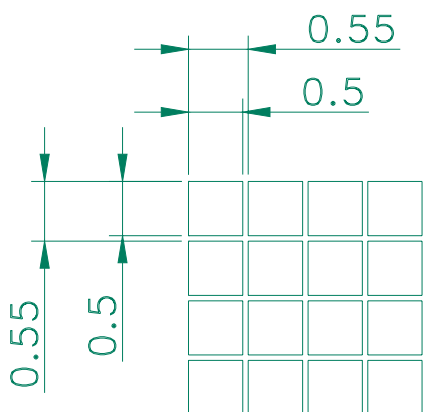
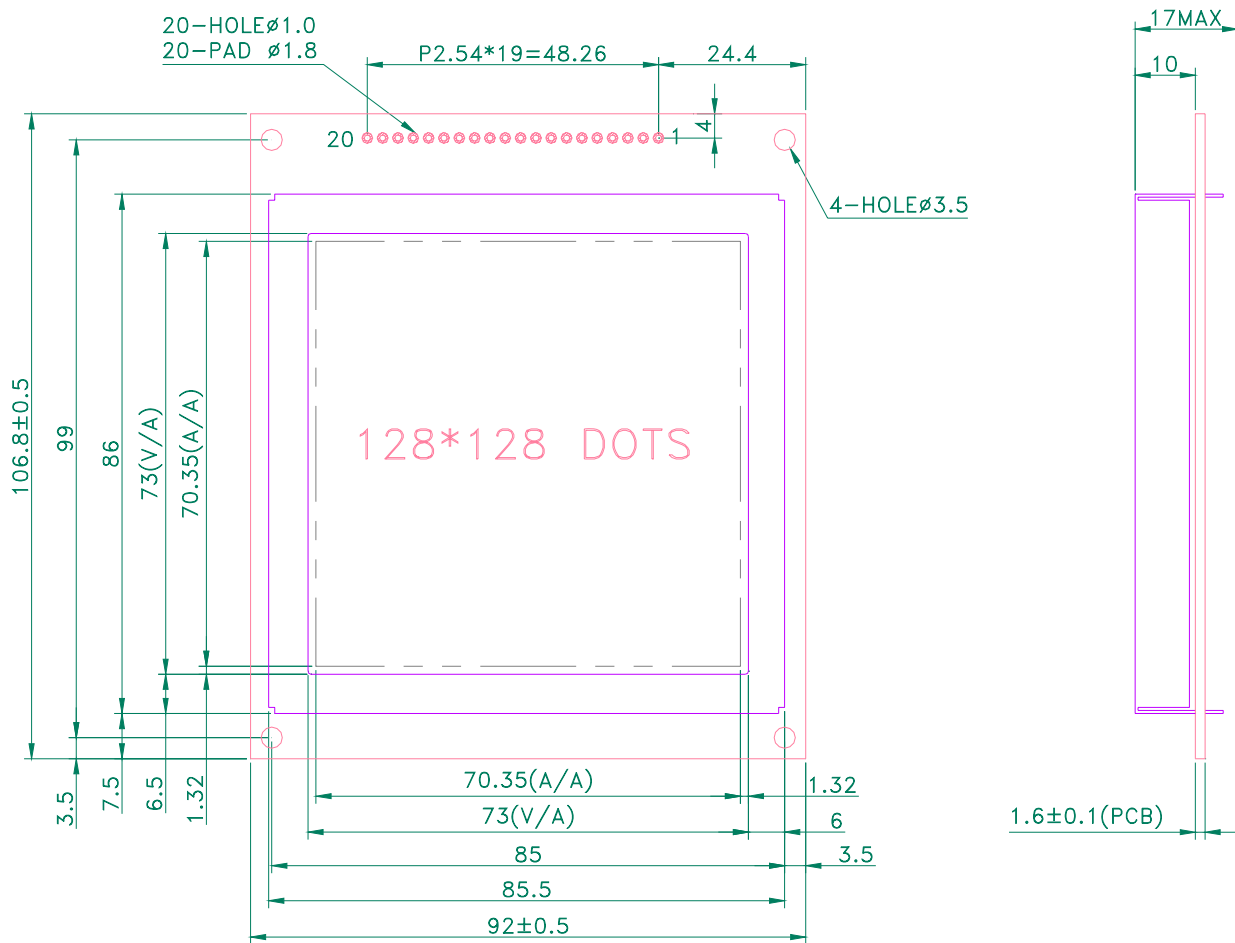
## 9. BLOCK DIAGRAM



Display Control Instruction:

**Please refer to the series of T6963C.**

# 10.OUTLINE DIMENSIONS



## 11. ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

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

## 12. RELIABILITY

### 12-1 RELIABILITY TEST

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	<ul style="list-style-type: none"> <li>• Operating Time: thirty minutes exposure for each direction (X,Y,Z)</li> <li>• Sweep Frequency: 10~55Hz (1 min)</li> <li>• Amplitude: 1.5mm</li> </ul>	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
THERMAL SHOCK	-20°C (30mins) ←→ +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±2°C, 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