



中显液晶
技术资料



中显COG使用说明书

ZX12864P-0

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北京市海淀区中关村大街32号和盛大厦811室
电话：(86)-010-82626833 传真：(86)-010-51601226
企业网站：<http://www.zxlcd.com>

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1. GENERAL SPECIFICATIONS :

1-1 SCOPE:

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

1-2 PRODUCTS:

Liquid Crystal Display Module (LCM)

1-3 MODULE NAME:

ZX12864P-0

2. FEATURES :

2-1 MAIN LCD (LARGE)

Item	Standard Value
Display Type	128 * 64 dots
LCD Type	STN, Yellow-Green,Reflective,positive,,Normal TEMP
Driver Condition	LCD Module: 1/65 Duty, 1/9Bias
Viewing Direction	6 O'clock
Backlight Type	WITHOUT B/L
Weight	TBD
Interface	8080 MPU interface
Driver IC	Driver IC: SPLC501C

3. MACHANICAL SPECIFICATIONS :

ITEM	SPECIFICATIONS	UNIT
OUTLINE DIMENSIONS	39.0(L) X41.0(W) X2.8max(H) (Include FPC) 39.0(L) X29.0(W) X 2.8max(H) (Exclude FPC)	mm
VIEWING AREA	36(L) x23.0(W)	mm
ACTIVE AREA	31.98(L) X16.94(W)	mm
DISP.CONSTRUCTION	128*64 dots	---
DOT SIZE	0.22(L) x 0.235(W)	mm
DOT PITCH	0.25(L) x 0.265(W)	mm
ASSY.TYPE	COG	---

WEIGHT

TBD

g

Note : For detailed information please refer to LCM drawing

4. ABSOLUTE MAXIMUM RATING

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY FOR LOGIC	VDD	Ta=25°C	-0.3	—	4.0	V
POWER SUPPLY FOR LCD DRIVING	Vlcd	Ta=25°C	-12	—	+0.3	V
INPUT VOLTAGE	VIN	Ta=25°C	VSS-0.3	—	VDD+0.3	V
OPERATION TEMPERATURE	TOPR	---	0	—	+50	°C
STORAGE TEMPERATURE	TSTG	---	- 20	—	+60	°C
Storage Humidity	H _D	Ta < 40 °C	-		90	%RH

NOTES:

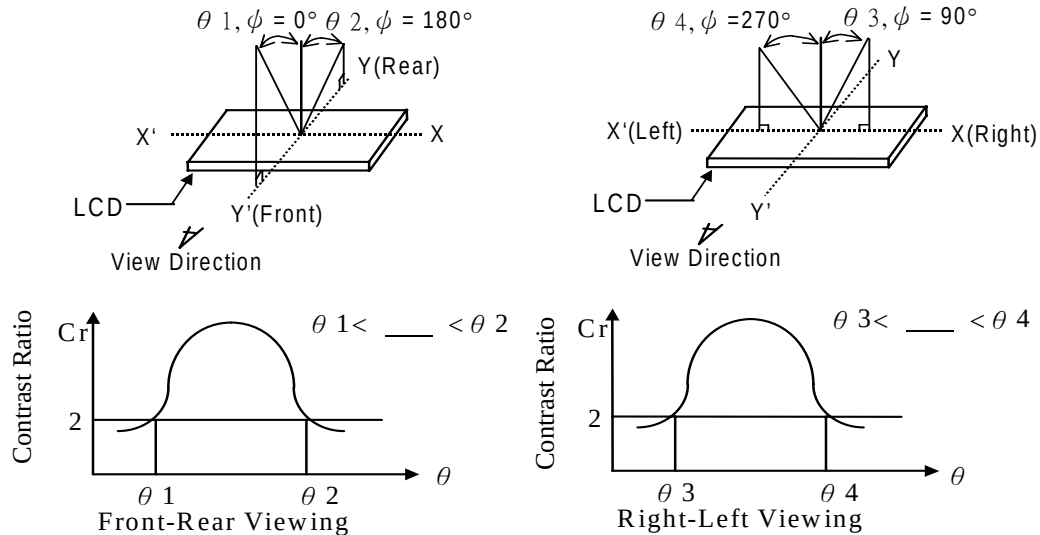
(1) LCM should be grounded during handling LCM.

5. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITIONS	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY VOLTAGE	VDD — VSS	Ta= +25°C	2.8	3.0	3.2	V
POWER SUPPLY FOR LCD DRIVING	VDD-V0	Ta= +25°C	10.2	10.5	10.8	V
INPUT VOLTAGE "H" LEVEL	VIH	—	0.8VDD	—	VDD	V
INPUT VOLTAGE "L" LEVEL	VIL	—	VSS	—	0.2VDD	V
OUTPUT VOLTAGE "H" LEVEL	VOH	IOH=-0.5mA	0.8VDD	—	VDD	V
OUTPUT VOLTAGE "L" LEVEL	VOL	IOL=0.5mA	VSS	—	0.2VDD	V
Supply Current	I _{DD}	V _{DD} = 3.0 V	-	0.3	0.5	mA
LCM Driver Voltage	V _{OP}	VDD-V0 (-20°C)	-	-	-	V
		VDD-V0 (25°C)	-	10.5	-	
		VDD-V0 (70°C)	-	-	-	

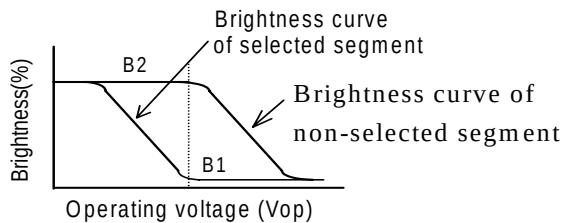
6.OPTICAL CHARACTERISTICS

(1) DEFINITION OF VIEWING ANGLE

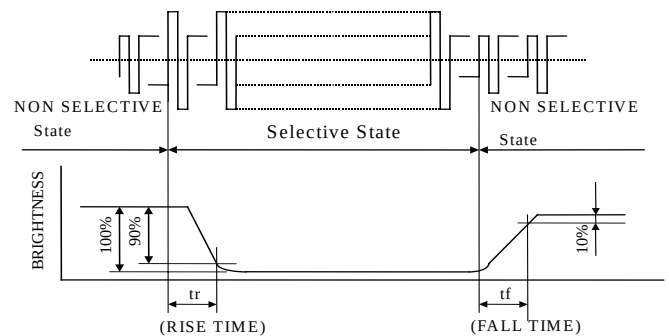


(2) DEFINITION OF CONTRAST

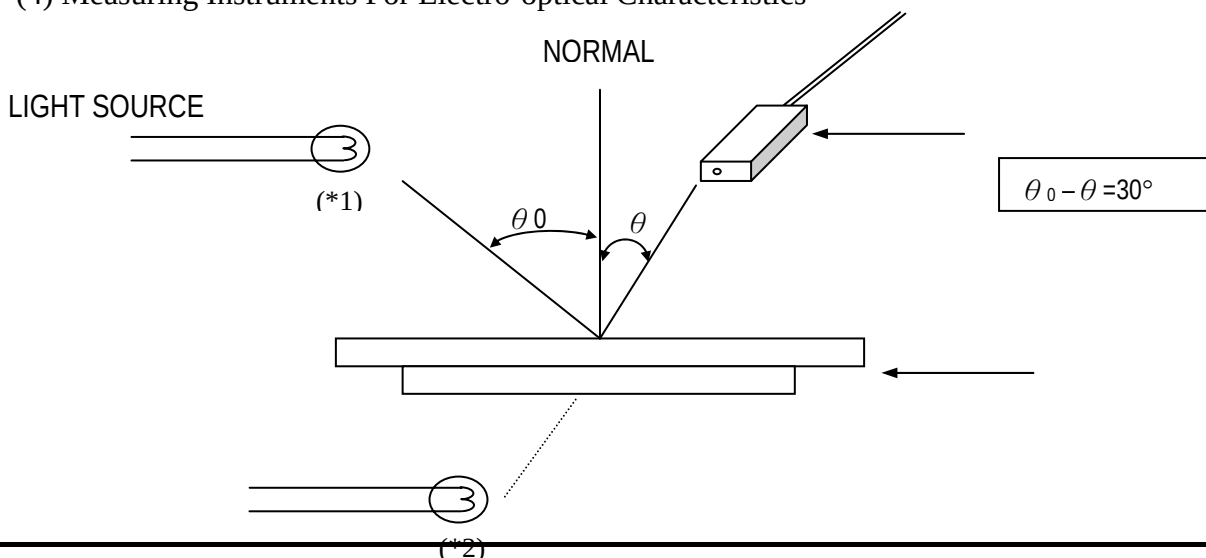
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



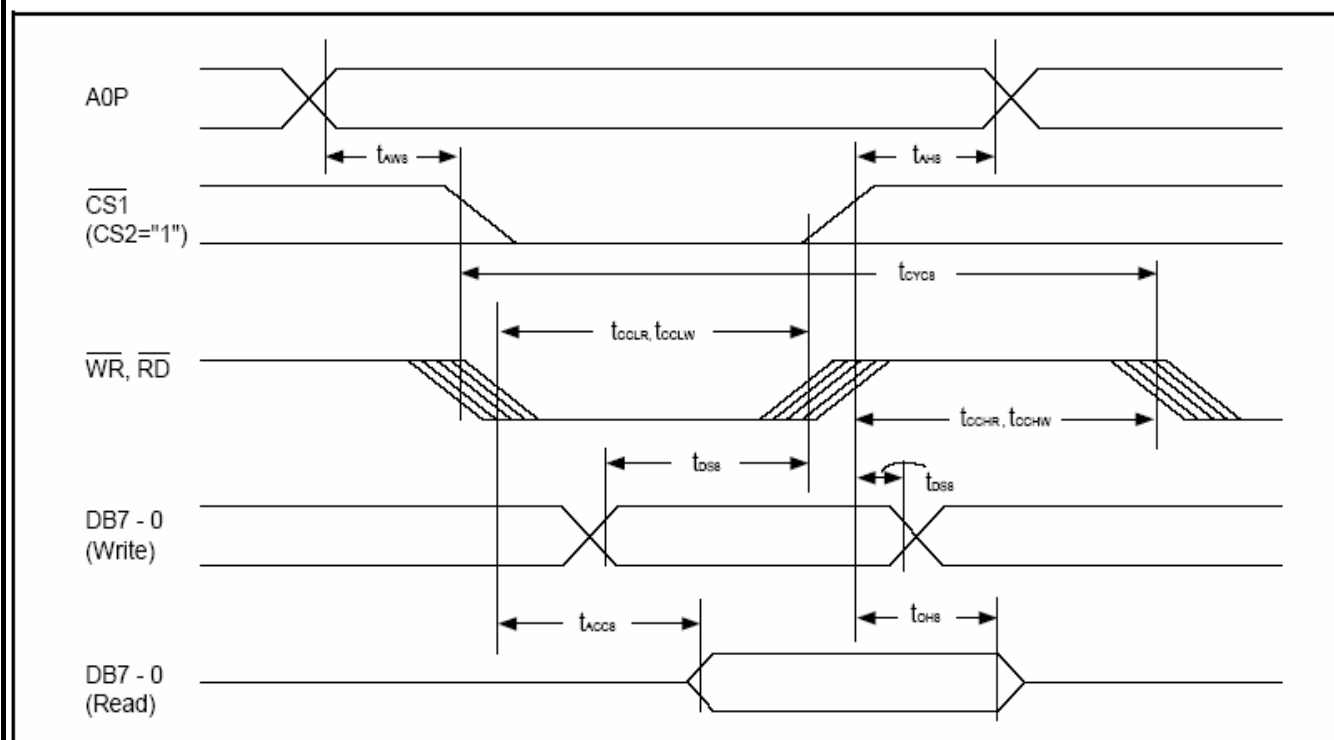
(3) DEFINITION OF RESPONSE



(4) Measuring Instruments For Electro-optical Characteristics



7.TIMING CHARACTERISTICS



(VDD = 2.7V to 4.5V, T_A = 25°C)

Item	Signal	Symbol	Condition	Rating		Units
				Min.	Max.	
Address hold time	A0P	t_{AH8}		0	-	ns
Address setup time	A0P	t_{AW8}		0	-	ns
System cycle time	A0P	t_{CYC8}		300	-	ns
Control L pulse width (WR)	WR	t_{CCLW}		60	-	ns
Control L pulse width (RD)	RD	t_{CCLR}		120	-	ns
Control H pulse width (WR)	WR	t_{CCHW}		60	-	ns
Control H pulse width (RD)	RD	t_{CCHR}		60	-	ns
Data setup time	DB7 - 0	t_{DS8}		40	-	ns
Address hold time		t_{DH8}		15	-	ns
RD access time		t_{ACC8}	$C_L = 100pF$	-	140	ns
Output disable time		t_{OH8}		10	100	ns

Note1: The input signal rise time and fall time (t_r , t_f) is specified at 15 ns or less. When the system cycle time is extremely fast, $(t_r + t_f) \leq (t_{CYC3} - t_{COLW} - t_{CCHW})$ for ($t_r + t_f$) $\leq (t_{CYC3} - t_{COLR} - t_{CCHR})$ are specified.

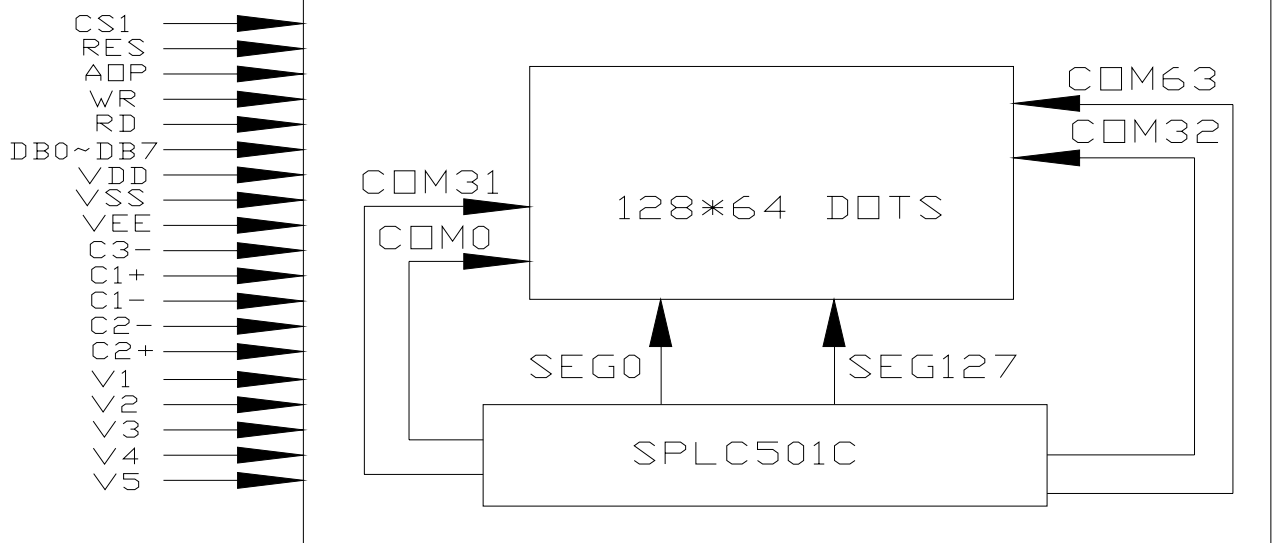
Note2: All timing is specified using 20% and 80% of VDD as the reference.

Note3: t_{COLW} and t_{COLR} are specified as the overlap between CS1 being 'L' (CS2 = 'H') and WR and RD being at the 'L' level.

9. PIN ASSIGNMENT

Pin NO.	Symbol	Input/Output	Description
1	CS1	I	These pins are the chip select inputs.
2	/RES	I	This pin is reset signal input.
3	AOP	I	This pin is Data/Command control pin.
4	WR	I	When connected to an 8080 MPU, this is LOW active.
5	RD	I	When connected to an 8080 MPU, this is LOW active.
6~13	DB0~DB7	I/O	This is an 8-bit bi-directional data bus that connects to an 8-bit or 16-bit standard MPU data bus.
14	VDD	I	LOGIC VOLTAGE SUPPLY
15	VSS	I	POWER GROUND
16	VEE	I	This is the most negative voltage supply pin of the chip.
17	C3-	I	Capacitor 3-pad for Internal DC/DC voltage converter
18	C1+	I	Capacitor 1+pad for Internal DC/DC voltage converter
19	C1-	I	Capacitor 1-pad for Internal DC/DC voltage converter
20	C2-	I	Capacitor 2-pad for Internal DC/DC voltage converter
21	C2+	I	Capacitor 2+pad for Internal DC/DC voltage converter
22~26	V1~V5	I	These are the LCD driving voltage levels. All these levels are referenced to V _{DD} .

10. BLOCK DIAGRAM



11.OUTLINE DIMENSIONS

12. ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITIONS	CRITERION
OPERATING TEMPERATURE	TOPR	0°C ~ +50°C	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
STORAGE TEMPERATURE	TSTG	-20°C ~ +60°C	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
HUMIDITY	—	See Note	WITHOUT CONDENSATION

13. RELIABILITY

13-1 RELIABILITY TEST

ITEM	CONDITIONS	CRITERION
OPERATING TEMPERATURE	HIGH TEMPERATURE +50°C 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERATURE 0°C 240HRS	
STORAGE TEMPERATURE	HIGH TEMPERATURE +60°C 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERATURE - 10°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	0°C (30mins) $\leftrightarrow$ 50°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

14. 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