CERT. No. 946535

SPECIFICATIONS

SAMPLE CODE：ZX12864P-9DYSYWN
REVISION.：1.00
Customer Approved
DATE:

BEIJING ZXTECHNOLOGY CO,.LTD			
Sales Sign	**QC Confirmed**	**Checked By**	**Designer**

□ Approval For Specifications Only.

■ Approval For Specifications and Sample.

RECORDS OF REVISION

DATE	REVISED NO.	REVISED DESCRIPTIONS	PREPARED	CHECKED	APPROVED
JUNE,8.2005	1.00	FIRST ISSUE	JOHE HE	JOHE HE	

CONTENTS

1. GENERAL SPECIFICATIONS：

1-1 SCOPE:

This specification covers the delivery requirements for the liquid crystal display delivered by ZXLCD TECHNOLOGY to Customer。

1-2 PRODUCTS:

Liquid Crystal Display Module (LCM)

1-3 MODULE NAME:

ZX12864P-9DYSYWN

2. FEATURES：

2-1 MAIN LCD (LARGE)

Item	Standard Value
Display Type	128 * 64 dots
LCD Type	STN, Yellow-Green,Transflective,positive,,Normal TEMP
Driver Condition	LCD Module: 1/65 Duty, 1/9Bias
Viewing Direction	6 O'clock
Backlight Type	Yellow-Green LED B/L
Weight	TBD
Interface	4-SPI MPU interface
Driver IC	Driver IC: SSD1815BZ

3. MACHANICAL SPECIFICATIONS：

ITEM	SPECIFICATIONS	UNIT
OUTLINE DIMEMSIONS	69.1(L) X75.0(W) X 6.0max(H) (Include FPC) 69.1(L) X50.0(W) X 6.0max(H) (Exclude FPC)	mm
VIEWING AREA	65.5(L) x38.0(W)	mm
ACTIVE AREA	6o.775(L) X 32.935(W)	mm
DISP.CONSTRUCTION	128*64 dots	---
DOT SIZE	0.49(L) x 0.45(W)	mm
DOT PITCH	0.515(L) x 0.475(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℃	-0.3	—	4.0	V
POWER SUPPLY FOR LCD DRIVING	Vlcd	Ta=25℃	0	—	-12	V
INPUT VOLTAGE	VIN	Ta=25℃	VSS-0.3	—	VDD+0.3	V
OPERATION TEMPERATURE	TOPR	---	-10	—	+50	℃
STORAGE TEMPERATURE	TSTG	---	- 20	—	+60	℃
Storage Humidity	H_D	Ta < 40 °C	-		90	%RH

NOTES:

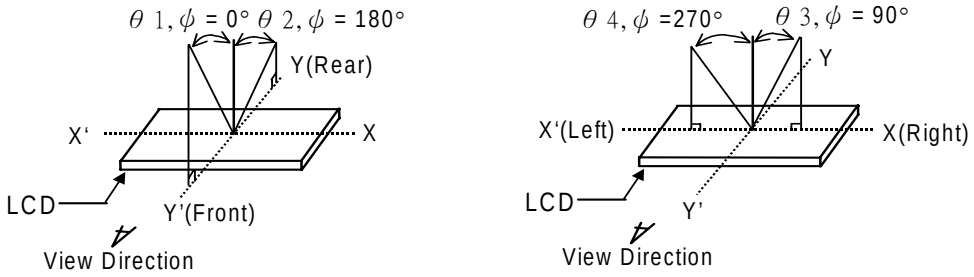
(1) LCM should be grounded during handling LCM.

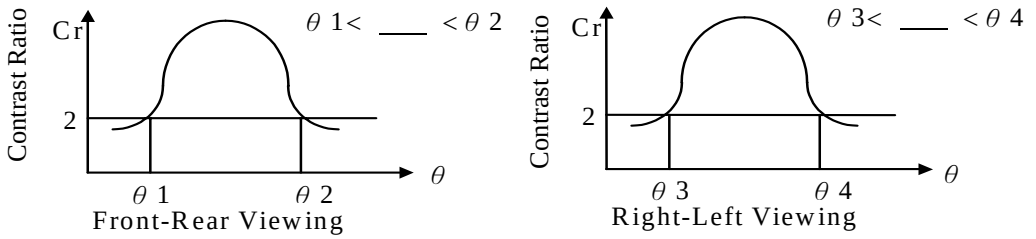
5. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITIONS	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY VOLTAGE	VDD－VSS	Ta= +25℃	2.8	3.0	3.2	V
POWER SUPPLY FOR LCD DRIVING	VDD-V0	Ta= +25℃	8.7	9.0	9.3	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}	$V_0 – V_{ss}$ (-20°C)	-	-	-	V
		$V_0 – V_{ss}$ (25°C)	-	9.0	-	
		$V_0 – V_{ss}$ (70°C)	-	-	-	

6.OPTICAL CHARACTERISTICS

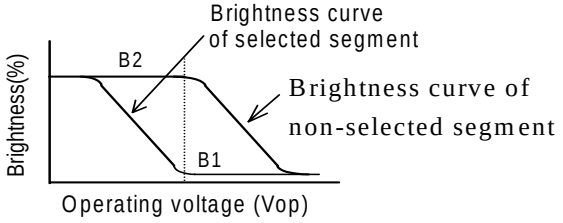
(1) DEFINITION OF VIEWING ANGLE



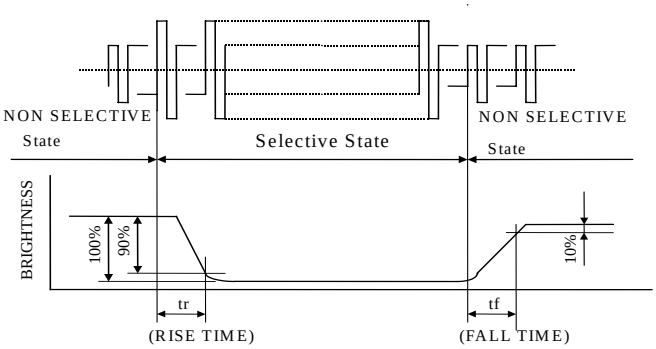


(2) DEFINITION OF CONTRAST

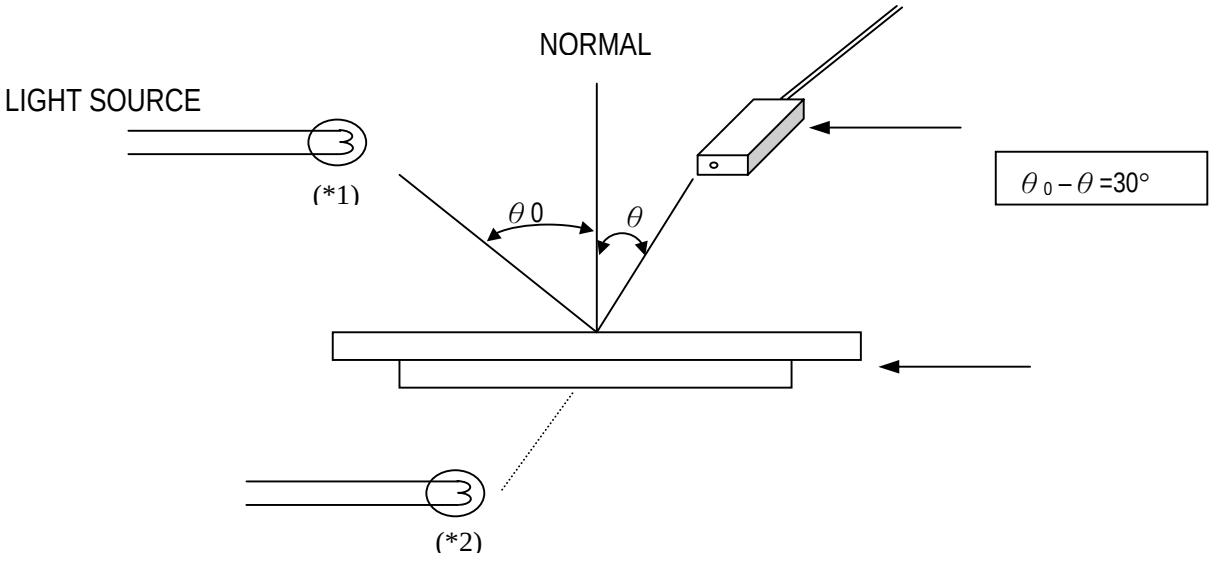
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



(3) DEFINITION OF RESPONSE



(4) Measuring Instruments For Electro-optical Characteristics



7.0 Backlight Characteristics

LCD Module with LED Backlight

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25°C	-	100	mA
Reverse Voltage	VR	Ta =25°C	-	8	V
Power Dissipation	PO	Ta =25°C	-	0.5	W
Operating Temperature	T_{OP}	-	-10	+50	℃
Storage Temperature	T_{ST}	-	-20	+60	℃

Electrical / Optical Characteristics

Ta =25℃

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=50 mA	4.0	4.1	4.2	V
Reverse Current	IR	VR=8V	-	-	0.5	mA
Wavelenght		IF=50 mA	-	572	-	nm
Uniformity *1 (with LCD) *1	△B	IF=50mA	75%	-	-	*2
Color	Yellow-Green					

*1 This vaule will be changed while mass production . testing by BM7

*2：△B=B(min) / B(max)

8.TIMING CHARACTERISTICS

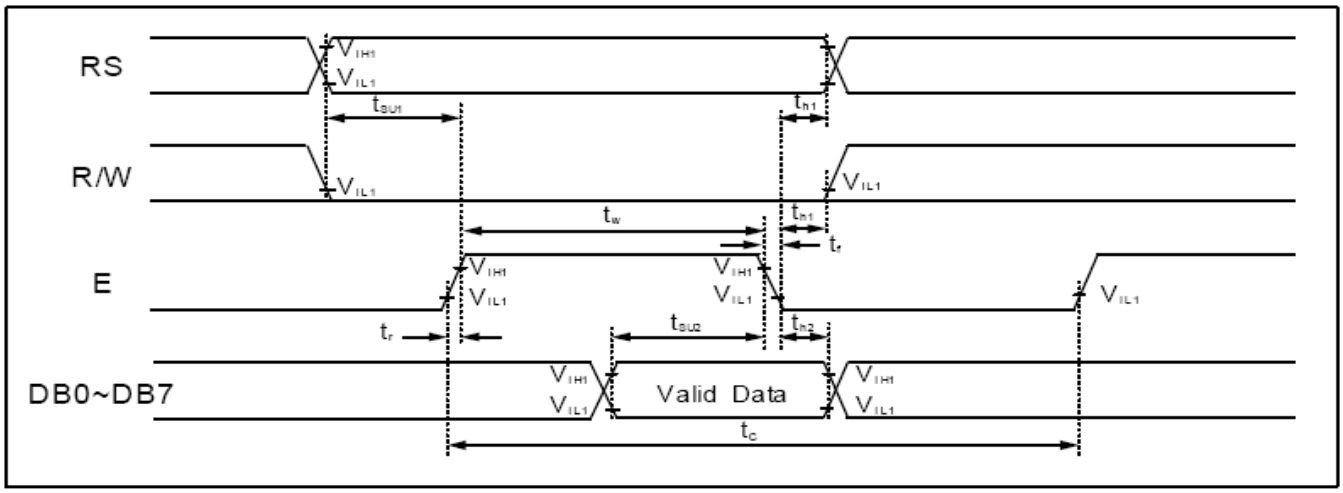


Figure 6 . Write Mode Timing Diagram

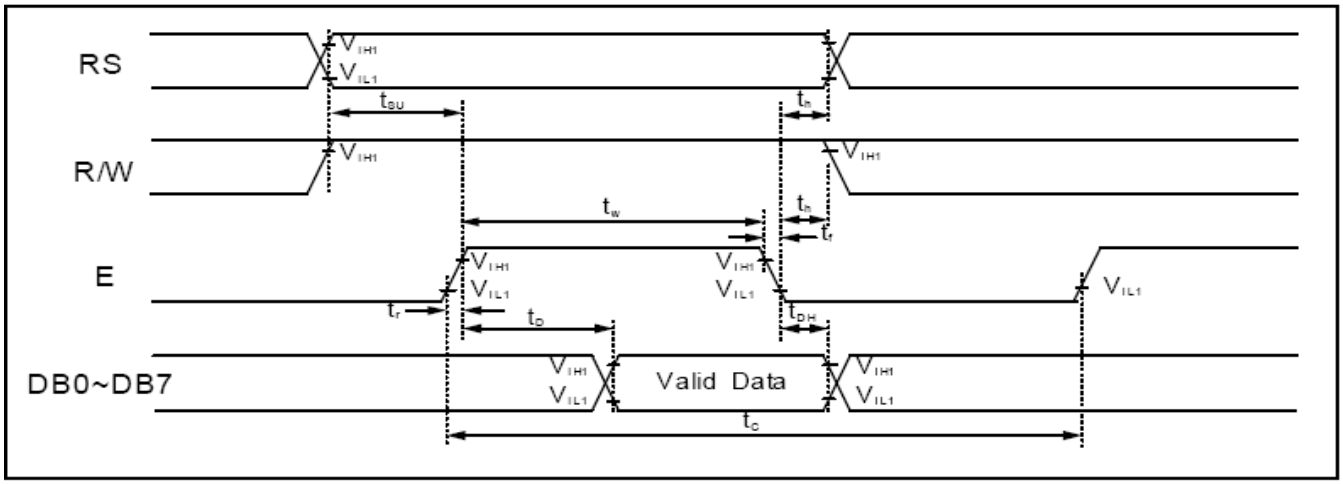


Figure 7 . Read Mode Timing Diagram

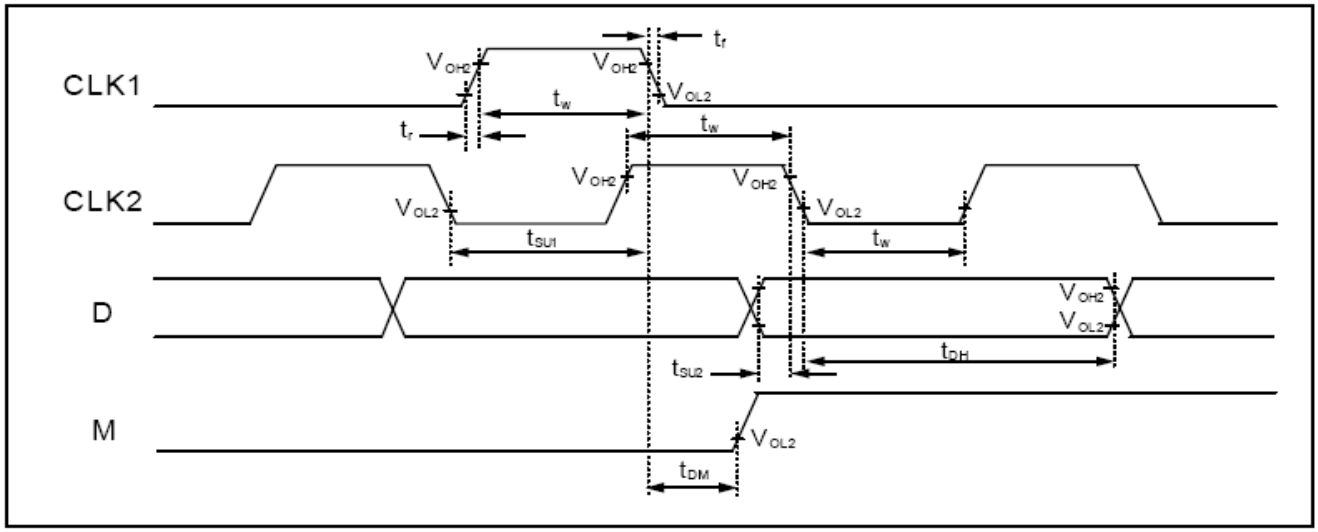
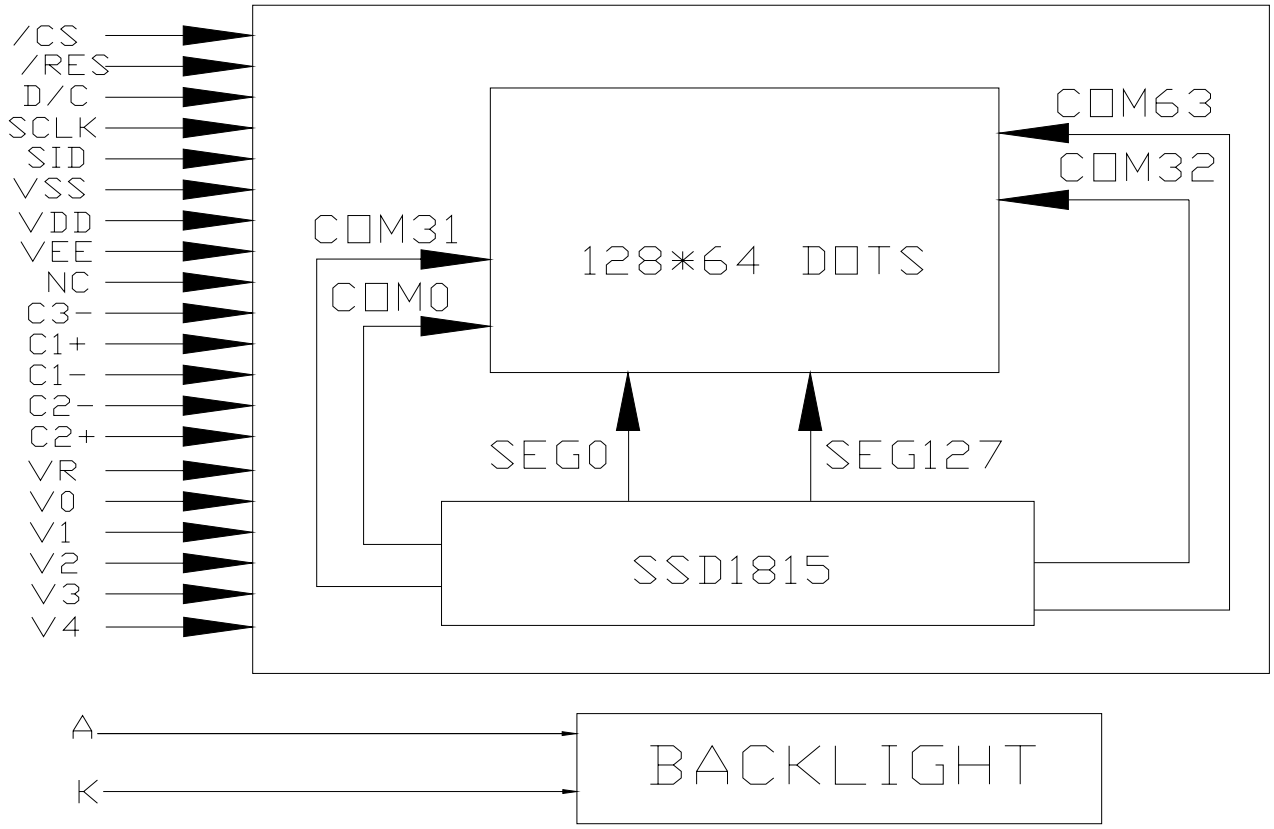


Figure 8 . Interface Mode With Extension Driver Timing Diagram

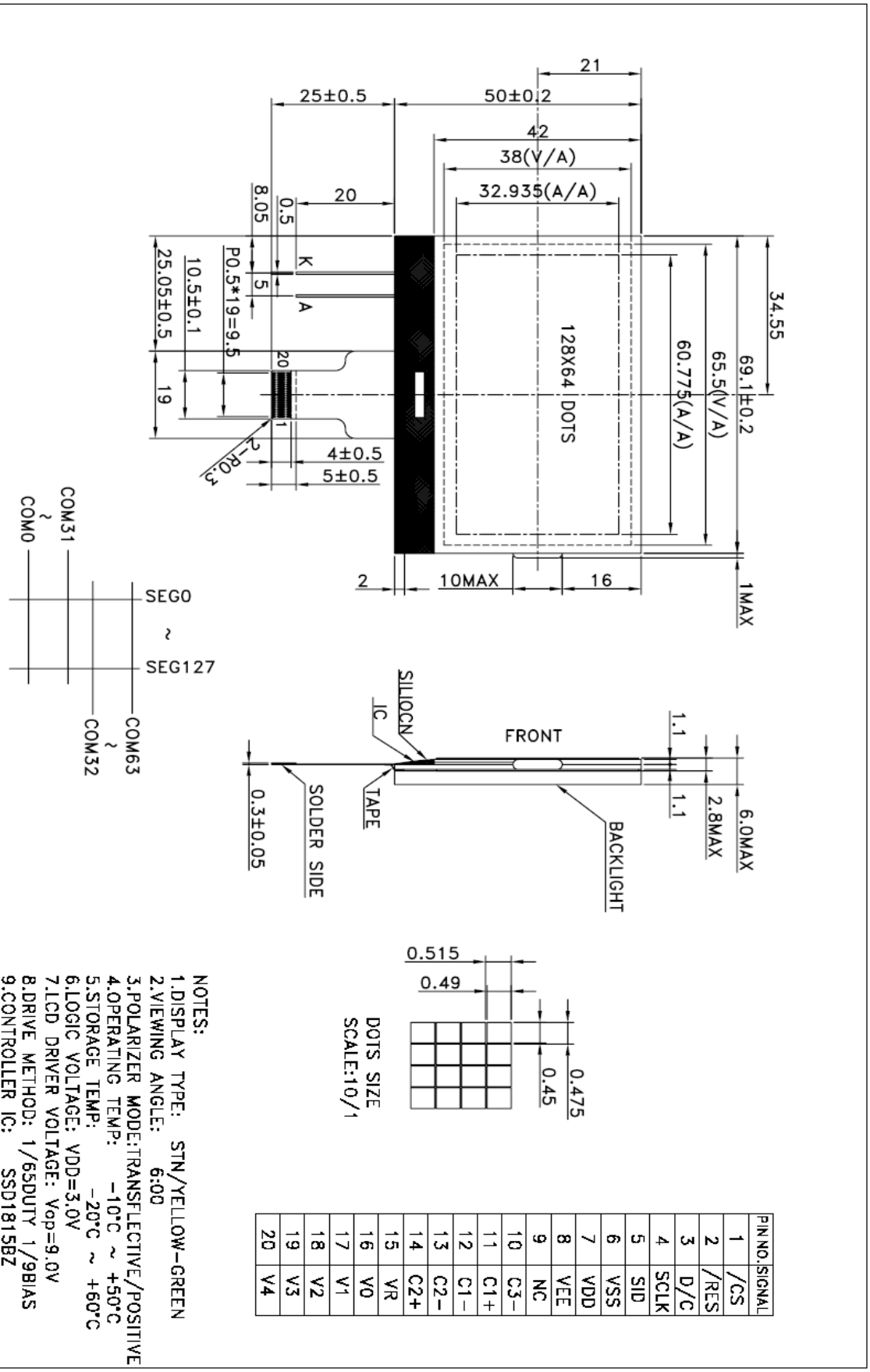
9. PIN ASSIGNMENT

Pin NO.	Symbol	Input/Output	Description
1	/CS	I	These pins are the chip select inputs
2	/RES	I	This pin is reset signal input.
3	D/C	I	This pin is Data/Command control pin.
4	SCLK	I/O	D_6 is the serial clock input (SCK).
5	SID	I/O	D_7 is the serial data input
6	VSS	I	POWER GROUD
7	VDD	I	LOGIC VOLTAGE SUPPLY
8	**VEE**	I	This is the most negative voltage supply pin of the chip.
9	NC		NOT CONNECTOR
10	C3-	I	Capacitor 3-pad for Internal DC/DC voltage converter
11	C1+	I	Capacitor 1+pad for Internal DC/DC voltage converter
12	C1-	I	Capacitor 1-pad for Internal DC/DC voltage converter
13	C2-	I	Capacitor 2-pad for Internal DC/DC voltage converter
14	C2+	I	Capacitor 2+pad for Internal DC/DC voltage converter
15	VR	I	This pin is the input of the built-in voltage regulator for generating V_{L6}.
16~20	V0~V4	I	These are the LCD driving voltage levels. All these levels are referenced to V_{DD}.

10. BLOCK DIAGRAM



11.OUTLINE DIMENSIONS



PIN NO.	SIGNAL
1	/CS
2	/RES
3	D/C
4	SCLK
5	SID
6	VSS
7	VDD
8	VEE
9	NC
10	C3−
11	C1+
12	C1−
13	C2−
14	C2+
15	VR
16	V0
17	V1
18	V2
19	V3
20	V4

NOTES:
1.DISPLAY TYPE: STN/YELLOW-GREEN
2.VIEWING ANGLE: 6:00
3.POLARIZER MODE:TRANSFLECTIVE/POSITIVE
4.OPERATING TEMP: -10°C ~ +50°C
5.STORAGE TEMP: -20°C ~ +60°C
6.LOGIC VOLTAGE: VDD=3.0V
7.LCD DRIVER VOLTAGE: Vop=9.0V
8.DRIVE METHOD: 1/65DUTY 1/9BIAS
9.CONTROLLER IC: SSD1815BZ
10.BACKLIGHT TYPE: LED(YELLOW-GREEN)

REV.	DESCRIPTION	DATE

DRAW NO.	12864P-9DYSYWN	DRAWN	ME CHECKED	EE CHECKED	APPROVED
UNIT:mm	PAGE:1/1 VER: A SCALE:1/1				
TOLERANCE UNLESS:±0.2					

12. ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITIONS	CRITERION
OPERATING TEMPERATURE	TOPR	-10℃～+50℃	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
STORAGE TEMPERATURE	TSTG	-20℃～+60℃	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
HUMIDITY	—	See Note	WITHOUT CONDENSATION

13.RELIABITY

13-1 RELIABILITY TEST

ITEM	CONDITIONS	CRITERION
OPERATING TEMPERATURE	HIGH TEMPERTURE +50℃ 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERTURE -10℃ 240HRS	
STORAGE TEMPERATURE	HIGH TEMPERTURE +50℃ 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERTURE - 20℃ 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	-10℃(30mins) ←→50℃(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

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