Control No. :	TR-S-087
Version No. :	1

SPECIFICATIONS

PRODUCT : LCD MODULE

MODEL NO.: G106056-22

CUSTOMER			SHING YIH TECH.		
APPROVED	CHECKED	CHECKED	APPROVED	CHECKED	PREPARED
			Kevin Mao		Y.U. Tsai

☐APPROVAL FOR SPECIFICATIONS ONLY
☐APPROVAL FOR SPECIFICATIONS AND SAMPLE

興益科技股份有限公司
SHING YIH TECHNOLOGY CO., LTD.

RECORDS OF REVISION

STANDARD DOC.	PRODUCT SPEC.	MODEL NO.	G106056-22		
DATE	**REVISED NO.**	**REVISED DESCRIPTIONS**	**PREPARED**	**CHECKED**	**APPROVED**
2002.1.16	1	INITIAL ISSUED	Y. U. Tsai		Kevin Mao

CONTENTS

1. GENERAL SPECIFICATIONS：

1-1 SCOPE:

This specification covers the delivery requirements for the liquid crystal display delivered by SHING-YIH Technology to Customer。

1-2 PRODUCTS:

Liquid Crystal Display Module (LCM)

1-3 MODULE NAME:

G106056-22

2. FEATURES：

1-1 Display type: FSTN, B/W, Transflective, 6o'clock, Positive

1-2 Driving Method: 1/65 duty， 1/9 bias

1-3 Built-in controller: KS0724

3. MACHANICAL SPECIFICATIONS：

ITEM	SPECIFICATIONS	UNIT
OUTLINE DIMEMSIONS	38.6(W) x 63.0(H) x 4.3(t)	mm
VIEWING AREA	32.6(W) x 17.6(H)	mm
DISP. CONSTRUCTION	106 x 56 dots	—
NUMBER OF DOTS	106 x 56	Dots
DOT SIZE	0.27(W) x 0.27(H)	mm
DOT PITCH	0.29(W) x 0.29(H)	mm
ASSY. TYPE	COG	—
BACKLIGHT	Light Guide	—
WEIGHT	ABOUT 5	g

4. ABSOLUTE MAXIMUM RATING

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY FOR LOGIC	$V_{DD}-V_{SS}$	Ta=25℃	-0.3	—	+7.0	V
POWER SUPPLY FOR LCD DRIVING	V_0-V_{SS}	Ta=25℃	-0.3	—	+17.0	V
INPUT VOLTAGE	V_I	Ta=25℃	-0.3	—	V_{DD}+0.3	V
OPERATION TEMPERATURE	T_{OPR}	—	- 20	—	+70	℃
STORAGE TEMPERATURE	T_{STG}	—	- 30	—	+80	℃

NOTE : LCM SHOULD BE GROUNDED DURING HANDLING LCM

5. ELECTRICAL CHARACTERISTICS (Ta=25℃)

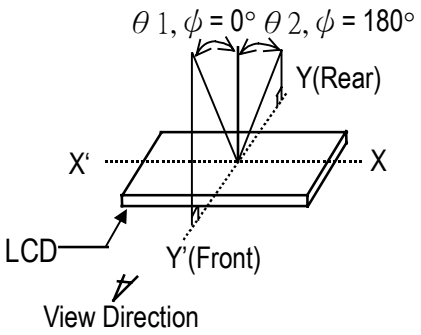
ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY VOLTAGE	$V_{DD}-V_{SS}$	Ta=25℃	2.7	3.0	3.3	V
POWER SUPPLY FOR LCD DRIVING	V_0-V_{SS}	Ta=25℃	9.21	9.5	9.79	V
INPUT VOLTAGE “H” LEVEL	V_{IH}	—	0.8 V_{DD}	—	V_{DD}	V
INPUT VOLTAGE “L” LEVEL	V_{IL}	—	V_{SS}	—	0.2 V_{DD}	V
OUTPUT VOLTAGE “H” LEVEL	V_{OH}	I_{OH}=-0.5mA	0.8 V_{DD}	—	V_{DD}	V
OUTPUT VOLTAGE “L” LEVEL	V_{OL}	I_{OL}=0.5mA	V_{SS}	—	0.2 V_{DD}	V
POWER SUPPLY CURRENT	I_{DD}	V_{DD}=5.0V V_{LCD}=7.8V	—	1.0	2.0	mA
	I_{EE}	—	—	—	—	uA

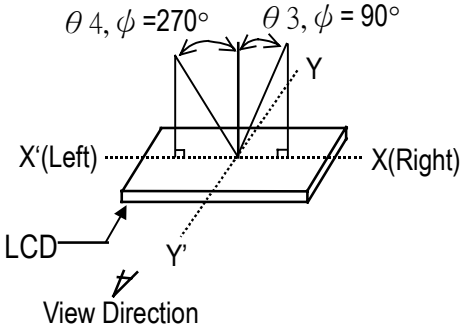
6.OPTICAL CHARACTERISTICS

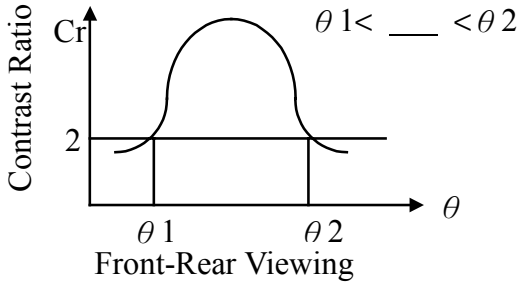
(Ta=25°C)

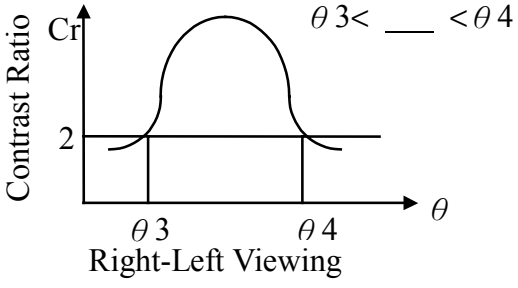
ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	NOTE
VIEWING ANGLE	θ 1	Cr≥2.0 Vop=9.5V	—	35	—	degree	(1)
	θ 2, θ 3, θ 4		—	30	—		
CONTRAST RATIO	Cr	VOP=9.5V	3	6	—	—	(2)
RESPONSE TIME (rise)	Tr	θ 1= 0° θ 2= 0°	—	120	—	ms	(3)
RESPONSE TIME (fall)	Tf	θ 1= 0° θ 2= 0°	—	180	—	ms	(3)

(1)DEFINITION OF VIEWING ANGLE



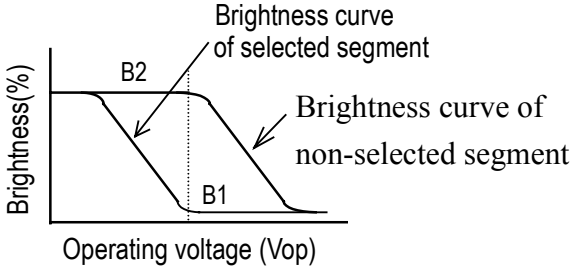




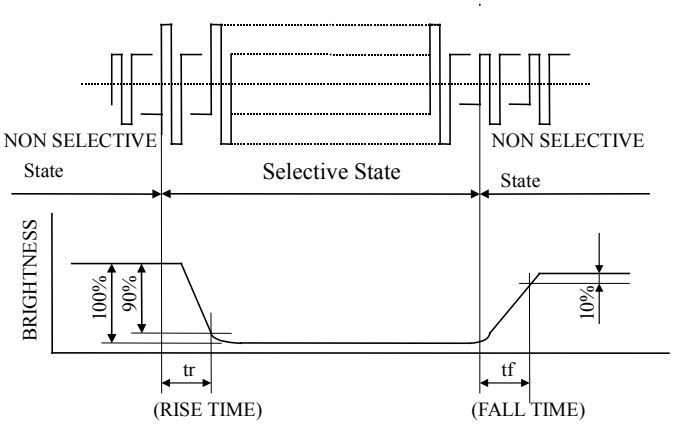


(2) DEFINITION OF CONTRAST

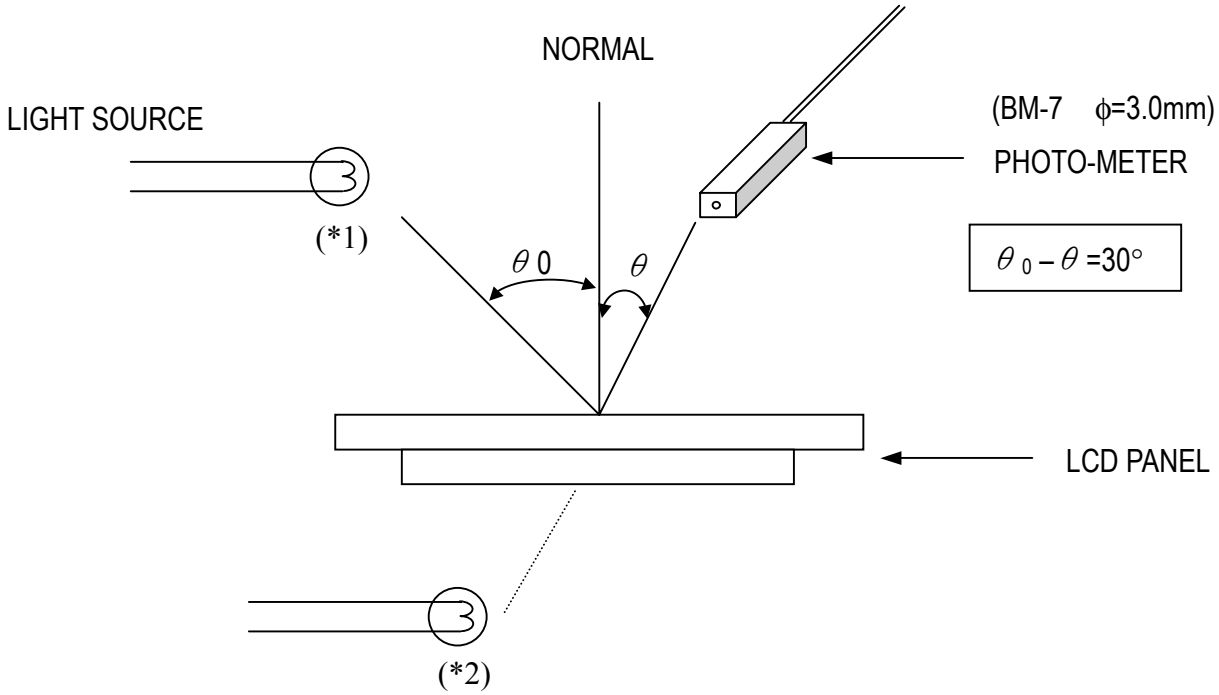
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



(3) DEFINITION OF RESPONSE



(4)Measuring Instruments For Electro-optical Characteristics



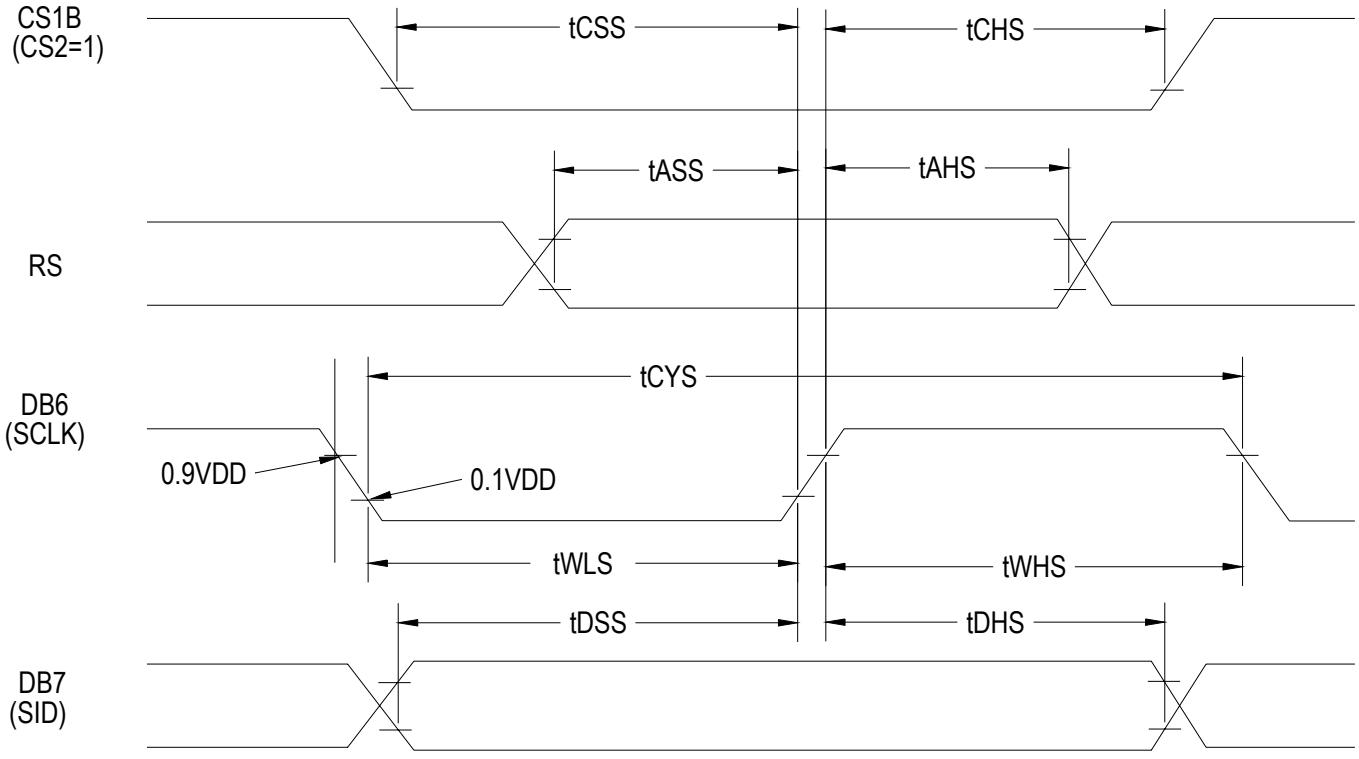
*1.Light source position for measuring the reflective type of LCD panel

*2.Light source position for measuring the transflective / transmissive types of LCD panel

7. TIMING CHARACTERISTICS

(V_{DD}=2.4 to 3.6V, Ta=-40 to +85℃)

ITEM	SIGNAL	SYMBOL	MIN.	TYP.	MAX.	UNIT
SERIAL CLOCK CYCLE	DB6 (SCLK)	t_{CYS}	250	—	—	ns
SCLK HIGH PULSE WIDTH		t_{WHS}	100	—	—	ns
SCLK LOW PULSE WIDTH		t_{WLS}	100	—	—	ns
ADDRESS SETUP TIME	RS	t_{ASS}	150	—	—	ns
ADDRESS HOLD TIME		t_{AHS}	150	—	—	ns
DATA SETUP TIME	DB7 (SID)	t_{DSS}	100	—	—	ns
DATA HOLD TIME		t_{DHS}	100	—	—	ns
CS1B SETUP TIME	CS1B	t_{CSS}	150	—	—	ns
CS1B HOLD TIME		t_{CHS}	150	—	—	ns

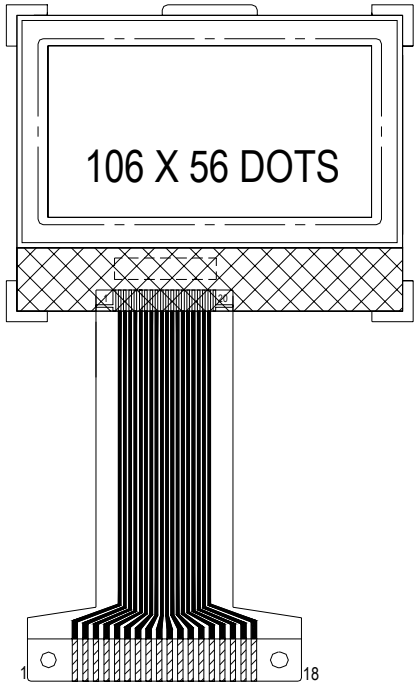


Serial Timing Characteristics

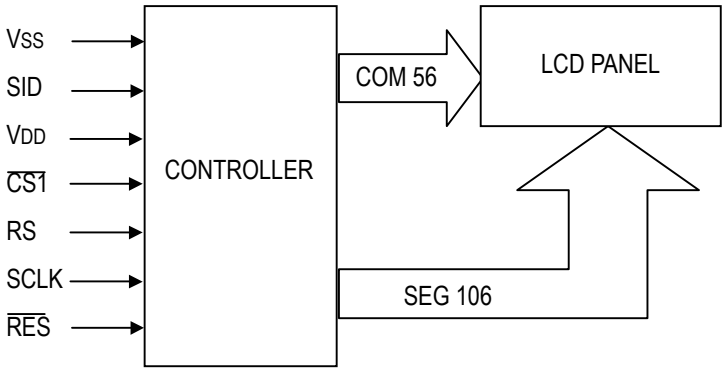
8. PIN ASSIGNMENT

PIN NO.	FUNCTION	SYMBOL
1	LCD OPERATING VOLTAGE	V0
2	LCD OPERATING VOLTAGE	V4
3	LCD OPERATING VOLTAGE	V3
4	LCD OPERATING VOLTAGE	V2
5	LCD OPERATING VOLTAGE	V1
6	DC / DC VOLTAGE CONVERTER	CAP2-
7	DC / DC VOLTAGE CONVERTER	CAP2+
8	DC / DC VOLTAGE CONVERTER	CAP1+
9	DC / DC VOLTAGE CONVERTER	CAP1-
10	DC / DC VOLTAGE CONVERTER	CAP3+
11	DC / DC VOLTAGE CONVERTER	VOUT
12	GND	VSS
13	POWER SUPPLY FOR LOGIC	VDD
14	SERIAL DATA INPUT	SID
15	SERIAL CLOCK INPUT	SCLK
16	H:D0~D7 ARE DISPLAY DATA, L: D0~D7 ARE CONTROL DATA	RS
17	RESET	/RST
18	CHIP SELECT SIGNAL	/CS1

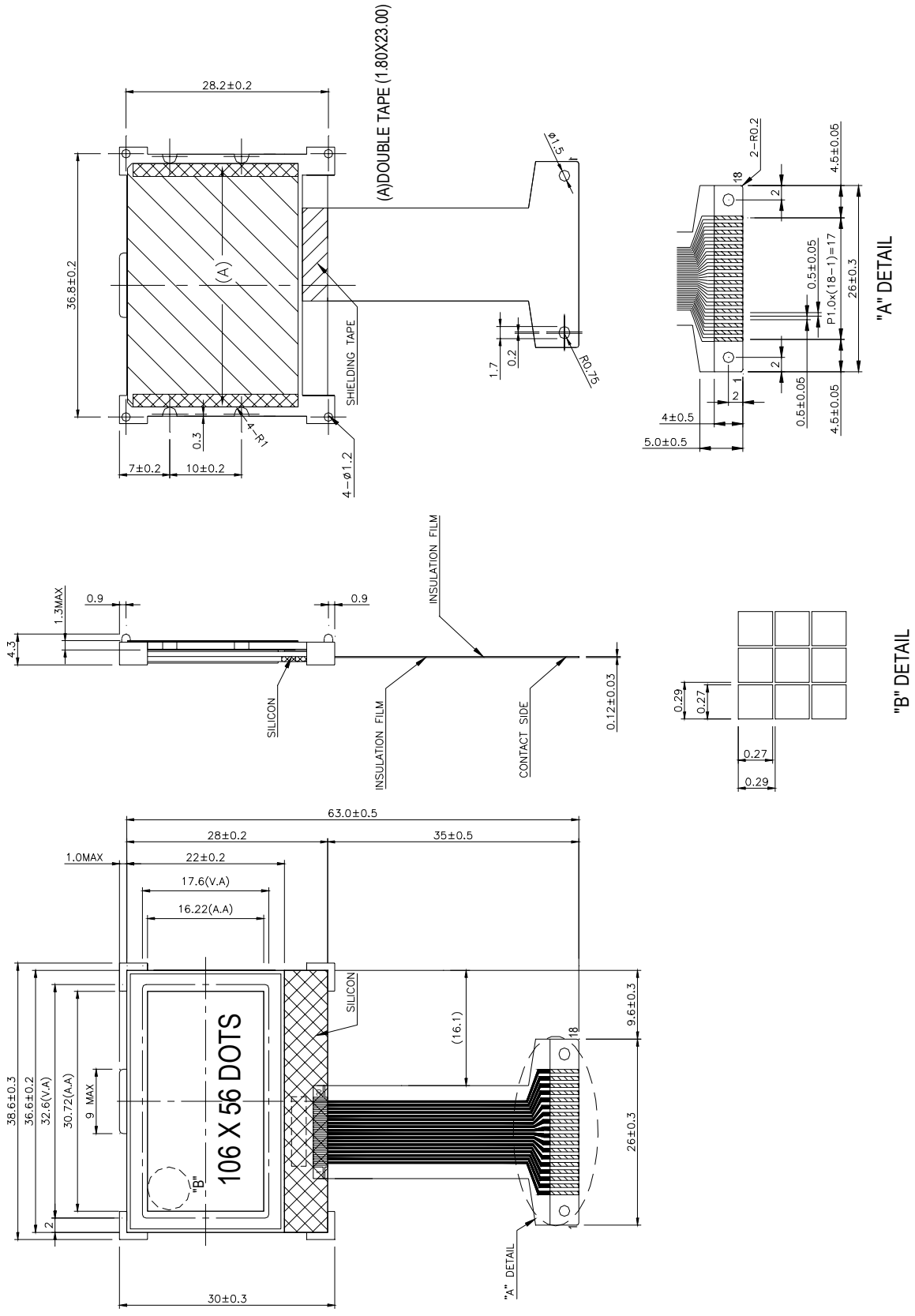
9. PIN NO



10. BLOCK DIAGRAM



11.OUTLINE DIMENSION



12. ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

12-1 TEMPERATURE RANGE

ITEM	SYMBOL	CONDITION	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

12-2 TEMPERATURE RANGE

ITEM	CONDITION	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

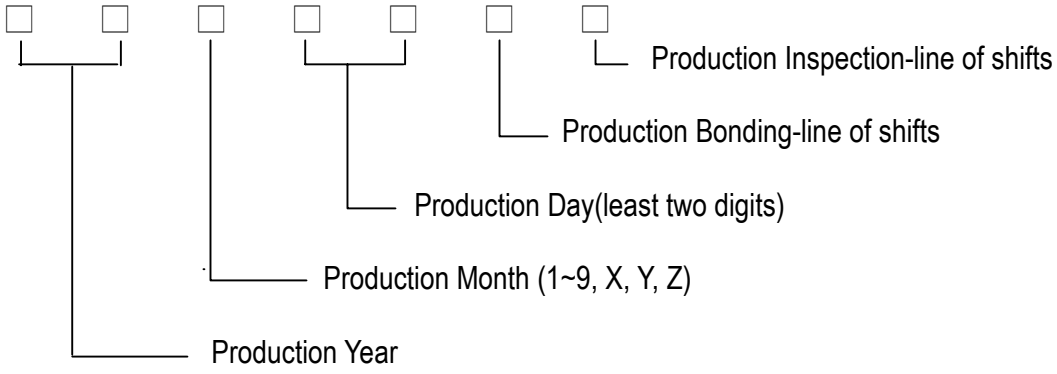
*NOTE: TEST CONDITION

(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. Code System of Production Lot

The production lot of module is specified on the back of FPC as follows;



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.