

SPECIFICATIONS

PRODUCT : LCD MODULE

MODEL NO. : XKM204A

CUSTOMER			SUCCESS		
APPROVED	CHECKED	CHECKED	APPROVED	CHECKED	PREPARED
					John he

STANDARD DOC.	PRODUCT SPEC.	MODULE NO.	XKM204A	PAGE	1/14
------------------	------------------	---------------	---------	------	------

CONTENTS

1.	GERENAL SPECIFICATIONS	2
2.	FEATURES	2
3.	MACHANICAL SPECIFICATIONS	2
4.	ABSOLUTE MAXIMUM RATINGS	3
5.	ELECTRICAL CHARACTERISTICS	3
6.	OPTICAL CHARACTERISTICS	4.5
7.	1.TIMING CHARACTERISTICS	6,7,8
	2 DISPLAY DATA RAM ADDRESS MAP	
	3 CGROM (CHARACTER GENERATER ROM) ADDRESS MA	
8.	PIN ASSIGNMENT	9
9.	BLOCK DIAGRAM	10
10.	OUTLINE DIMENSIONS	11
11.	ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS	12
12.	RELIABILITY	12
13.	PRECAUTION FOR USE	13,14

STANDARD DOC.	PRODUCT SPEC.	MODULE NO.	XKM204A	PAGE	2/14
------------------	------------------	---------------	---------	------	------

1. GENERAL SPECIFICATIONS :

1-1 SCOPE:

This specification covers the delivery requirements for the liquid crystal display delivered by SUCCESS ELECTRONIC to Customer.

1-2 PRODUCTS:

Liquid Crystal Display Module (LCM)

1-3 MODULE NAME:

XKM204A

2. FEATURES :

- (1) Display Type: STN, Yellow-Green mode, Transflective
- (2) Driving Method: 1/16 duty, 1/5 bias
- (3) Built-in controller: S6B0069
- (4) **LED Yellow Green Array Backlight**

3. MACHANICAL SPECIFICATIONS :

ITEM	SPECIFICATIONS	UNIT
OUTLINE DIMENSIONS	98.0(W) x60.0(H) x13.2MAX(T)	mm
VIEWING AREA	76.0 (W) x25.2(H)	mm
ACTIVE AREA	71.4(W) x21.12(H)	mm
DISP.CONSTRUCTION	20 CHARACTER X 4 LINE	---
CHARACTER CONSTRUCTION	5X8 DOTS	Dots
DOT SIZE	0.56(W) x 0.56(H)	mm
DOT PITCH	0.63(W) x 0.63(H)	mm
ASSY.TYPE	COB	---
BACKLIGHT	-	-
WEIGHT	TBD	g

4. ABSOLUTE MAXIMUM RATING

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY FOR LOGIC	VDD - VSS	Ta=25	-0.3	-	7.0	V
INPUT VOLTAGE	VIN	Ta=25	-0.3	-	VDD+0.3	V
OPERATION TEMPERATURE	TOPR	---	- 10	-	50	
STORAGE TEMPERATURE	TSTG	---	- 20	-	60	

NOTES:

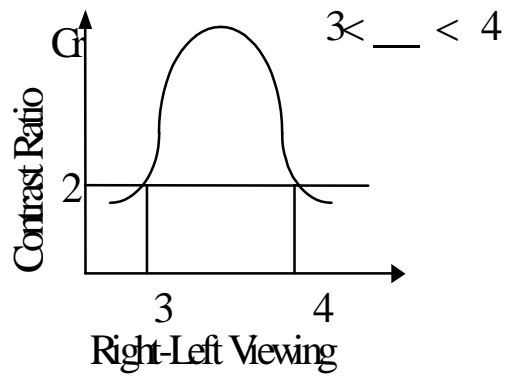
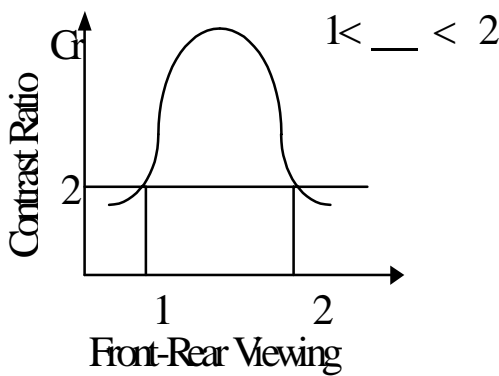
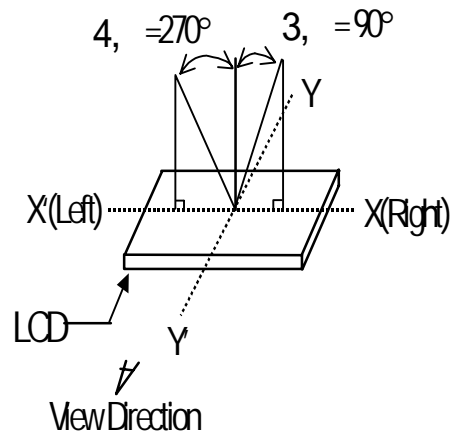
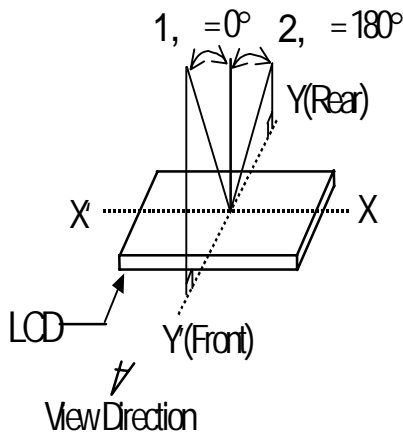
(1) LCM should be grounded during handling LCM.

5. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITIONS	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
POWER SUPPLY VOLTAGE	VDD - VSS	Ta= +25	4.5	5.0	5.5	V
POWER SUPPLY FOR LCD DRIVING	VDD - VL6	Ta= +25		4.8		V
Power Supply for backlight	LED+		-	4.1	-	V
	LED-			0		V
Input Current	I _{dd}	V _{dd} =5.0V	-	-	3	mA
LED Backlight Current	I _{led}	V _{LED+} =4.1V	-	180	-	mA
INPUT VOLTAGE "H" LEVEL	V _{IH}	-	0.7V _{dd}	-	V _{dd} +0.3	V
INPUT VOLTAGE "L" LEVEL	V _{IL}	-	-0.3	-	0.2V _{dd}	V
OUTPUT VOLTAGE "H" LEVEL	V _{OH}	I _{OH} =-100uA	0.7V	-	V _{dd} +0.3	V
OUTPUT VOLTAGE "L" LEVEL	V _{OL}	I _{OL} =100uA	-0.3	-	0.2V _{dd}	V

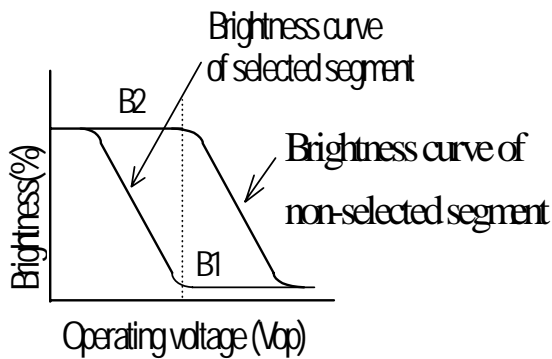
6. OPTICAL CHARACTERISTICS

(1) DEFINITION OF VIEWING ANGLE

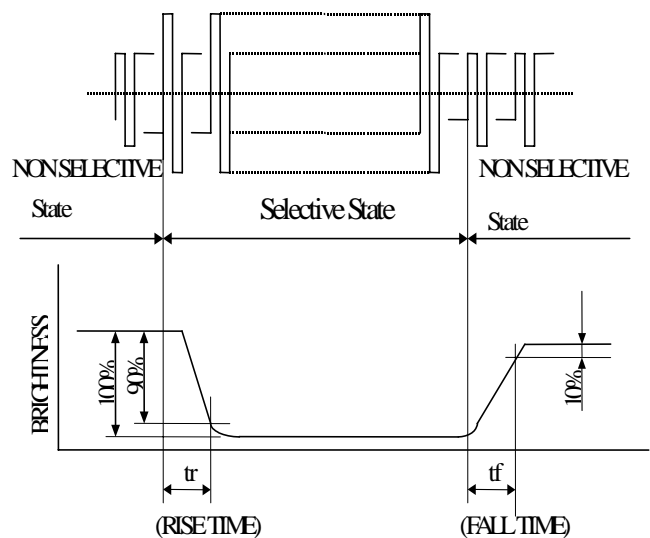


(2) DEFINITION OF CONTRAST

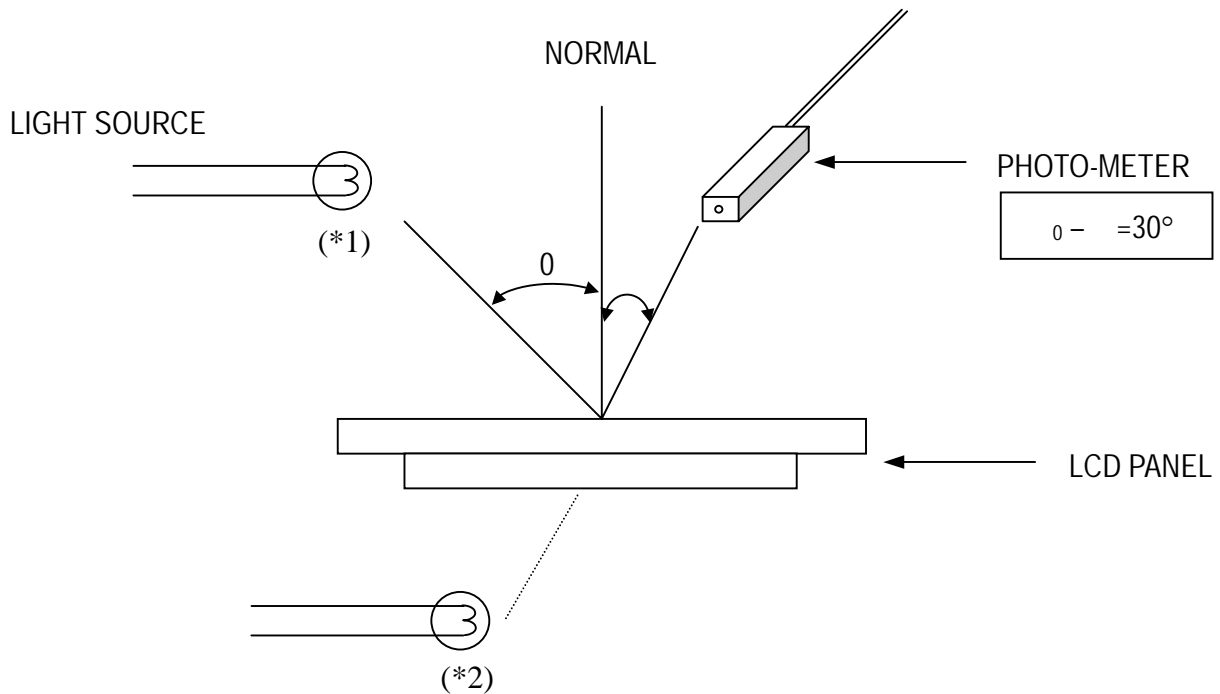
$$C.R = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



(3) DEFINITION OF RESPONSE



(4) Measuring Instruments For Electro-optical Characteristics

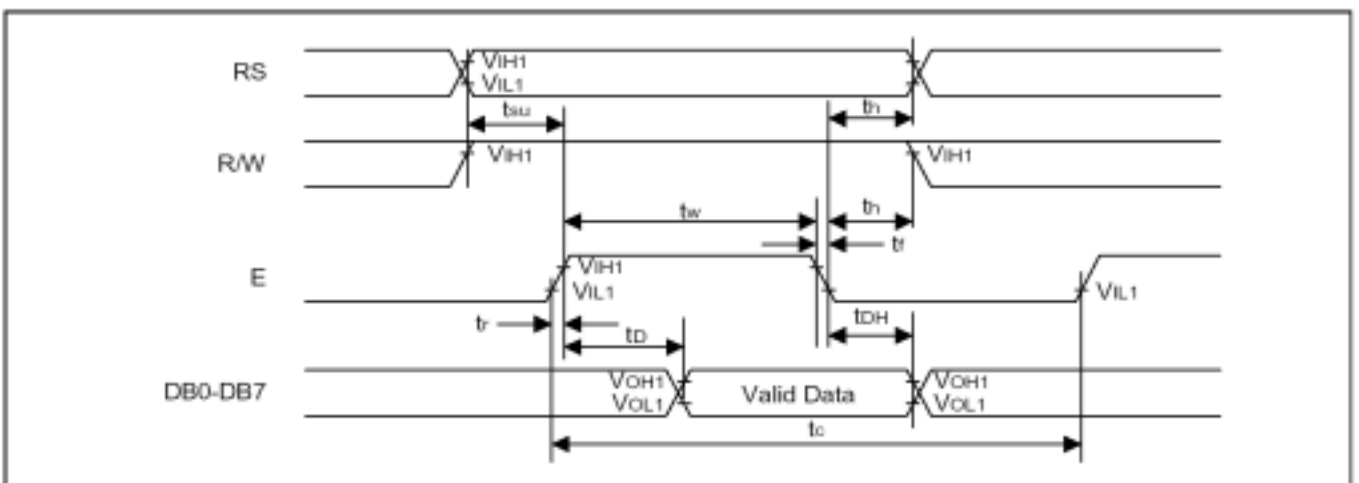
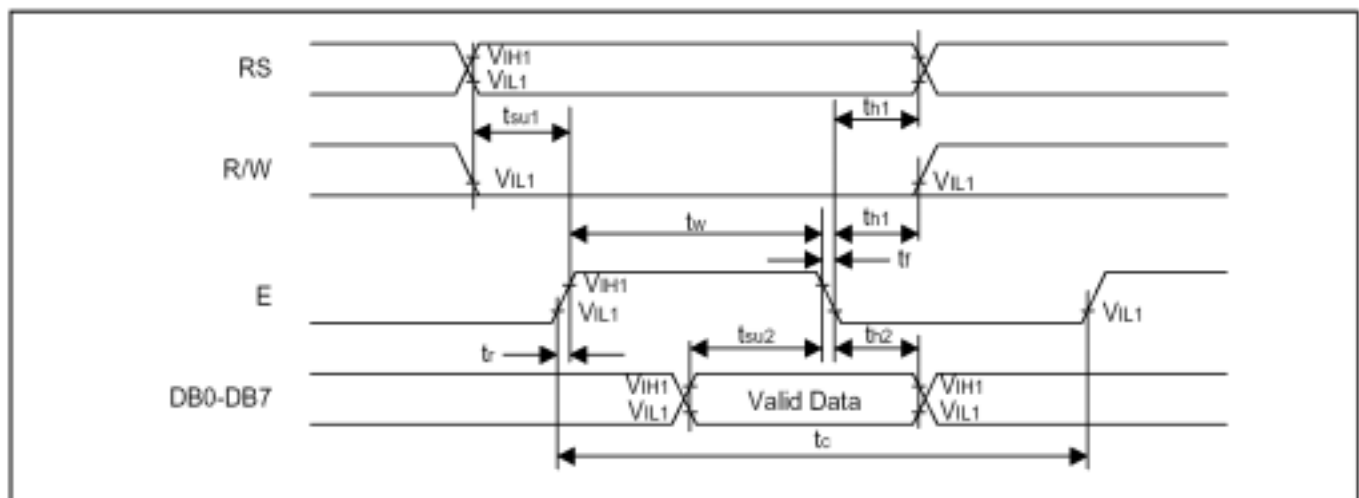


*1. Light source position for measuring the reflective type of LCD panel

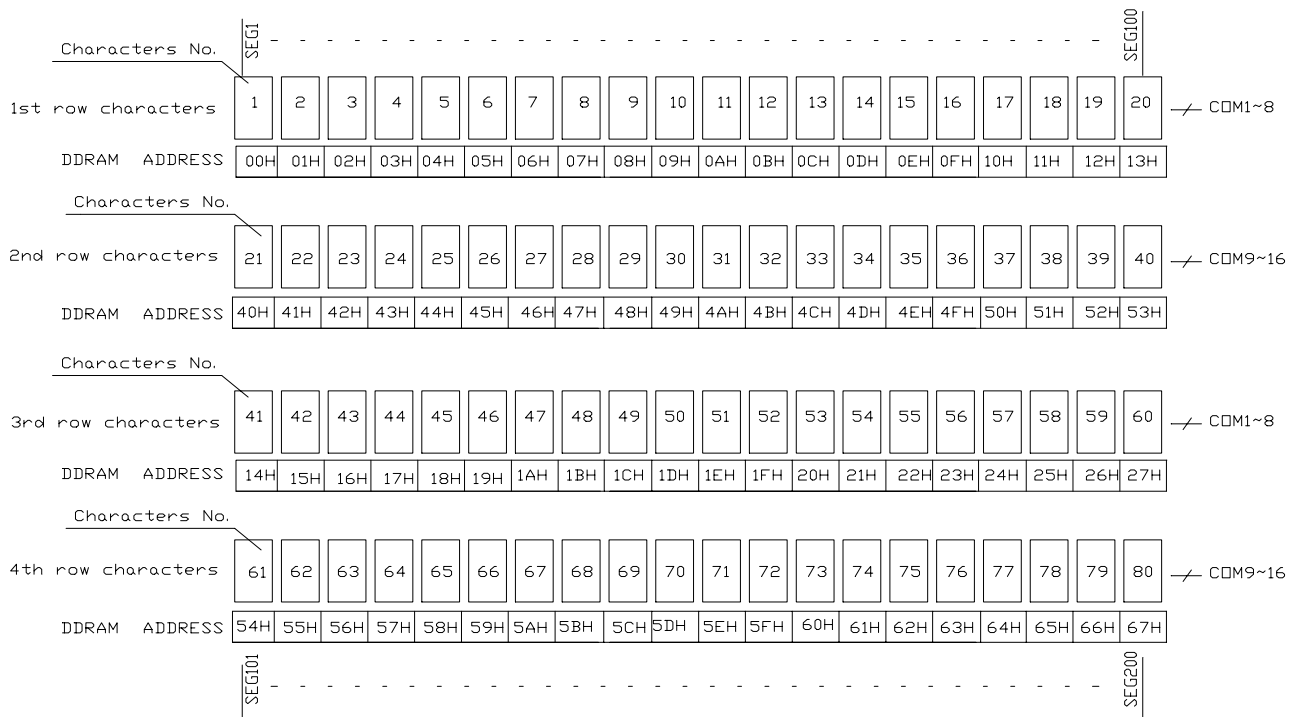
*2. Light source position for measuring the transfective / transmissive types of LCD panel

7.1 TIMING CHARACTERISTICS

Mode	Characteristics	Symbol	Min	Typ	Max	Unit
Write Mode (refer to Figure-6)	E Cycle Time	t_c	500	-	-	ns
	E Rise / Fall Time	t_R, t_F	-	-	20	
	E Pulse Width (High, Low)	t_w	230	-	-	
	R/W and RS Setup Time	t_{su1}	40	-	-	
	R/W and RS Hold Time	t_{H1}	10	-	-	
	Data Setup Time	t_{su2}	80	-	-	
	Data Hold Time	t_{H2}	10	-	-	
Read Mode (refer to Figure-7)	E Cycle Time	t_c	500	-	-	ns
	E Rise / Fall Time	t_R, t_F	-	-	20	
	E Pulse Width (High, Low)	t_w	230	-	-	
	R/W and RS Setup Time	t_{su}	40	-	-	
	R/W and RS Hold Time	t_H	10	-	-	
	Data Output Delay Time	t_D	-	-	120	
	Data Hold Time	t_{DH}	5	-	-	



7.2 DISPLAY DATA RAM ADDRESS MAP



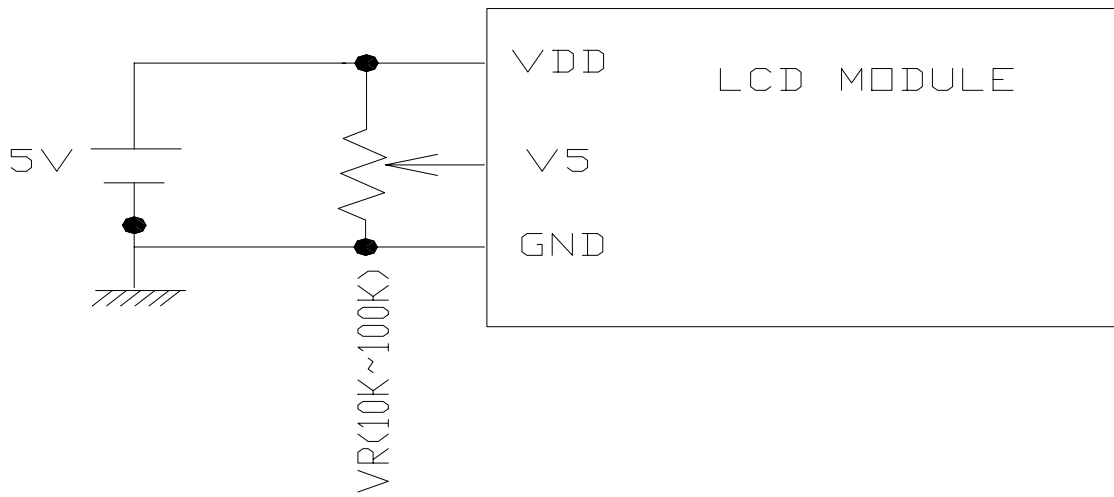
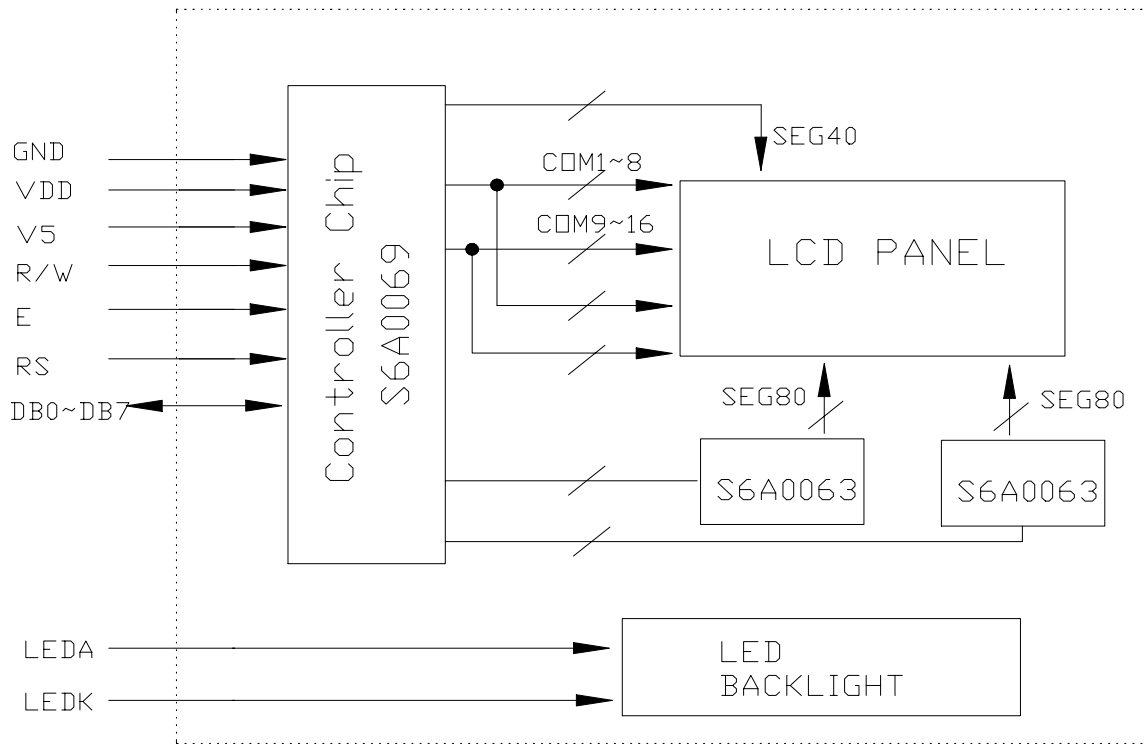
7.3 CGROM (CHARACTER GENERATOR ROM) ADDRESS MAP

Upper 4bit Lower 4bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)															
LLLH	(2)															
LLHL	(3)															
LLHH	(4)															
LHLL	(5)															
LHLH	(6)															
LHHL	(7)															
LHHH	(8)															
HLLL	(1)															
HLLH	(2)															
HLHL	(3)															
HLHH	(4)															
HLL	(5)															
HHLH	(6)															
HHHL	(7)															
HHHH	(8)															

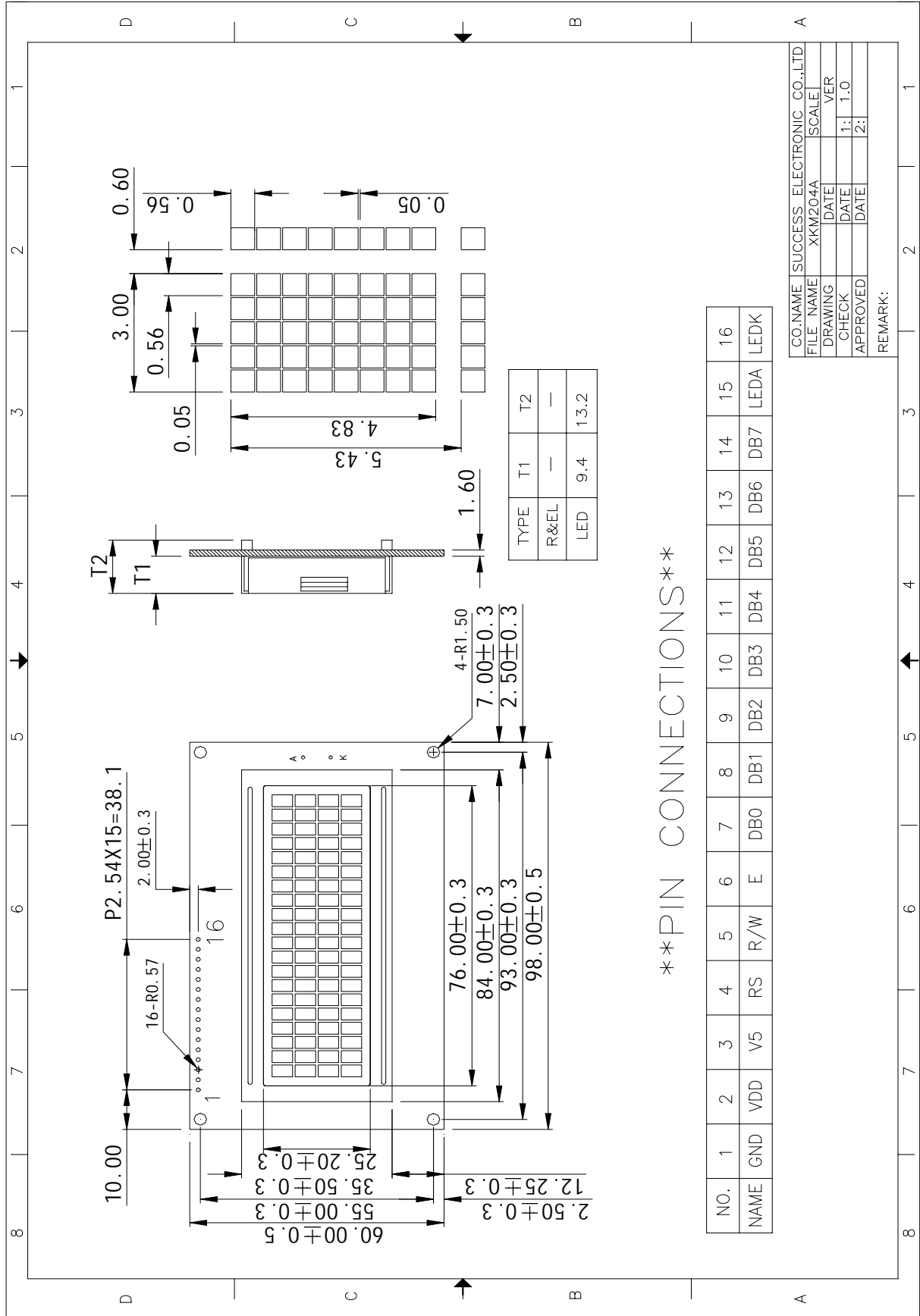
8. PIN ASSIGNMENT

PIN NO.	FUNCTION DESCRIPTIONS	SYMBOL
1	Ground.	GND
2	Power supply for logic.	VDD
3	Operating voltage for LCD.	V5
4	Register select. H: Data code input; L: instruction code input.	RS
5	Read/Write. H: Read operation; L: Write operation	R/W
6	Enable	E
7~14	Data bus	DB0~DB7
15	Anode of LED backlight power supply. H: On, L: Off	LEDA
16	Cathode of LED backlight power supply	LEDK

9. BLOCK DIAGRAM



10. OUTLINE DIMENSIONS



CO. NAME	SUCCESS ELECTRONIC CO., LTD
FILE NAME	XKM204A
DRAWING	SCALE
CHECK	DATE
APPROVED	DATE
REMARK:	DATE
	VER
	1: 1.0
	2:

11. 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

12. RELIABILITY

12-1 RELIABILITY TEST

ITEM	CONDITIONS	CRITERION
OPERATING TEMPERATURE	HIGH TEMPERATURE +70 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERATURE - 20 240HRS	
STORAGE TEMPERATURE	HIGH TEMPERATURE +80 240HRS	NO DEFECT IN DISPLAYING AND OPERATIONAL FUNCTION
	LOW TEMPERATURE - 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) ←→ +65 (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

STANDARD DOC.	PRODUCT SPEC.	MODEL NO.	XKM204A	PAGE	13/14
------------------	------------------	--------------	---------	------	-------

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.