

ILLUMINANT北極光企業有限公司

PRODUCT SPECIFICATION FOR TFT LCM

CUSTOMER:	
MODEL NO:	IC-B160203-6YFLYA
ACCEPTED BY:	

APPROVED BY:	CHECKED BY:	ORGANIZED BY:
		

☐ **Approval for Specifications Only**

☒ **Approval for Specifications and Sample**

Note: 1. Version of Specifications : 1
2. Others: Rohs Compliment

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RECORDS OF REVISION

DATE	REVISED NO.	REVISED DESCRIPTIONS	PREPARED	CHECKED	APPROVED
2009.04.16	01	FIRST ISSUE			

3. GENERAL SPECIFICATIONS

3-1 SCOPE :

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

3-2 PRODUCTS :

Liquid Crystal Display Module (LCM)

3-3 MODULE NAME

IC-B160203-6YFLYA

4. FEATURES

- (1) Display Type : STN/YELLOW-GREEN, 6 O'clock, Transflective/Positive
- (2) Driving Method : 1/16 duty, 1/5 bias
- (3) Built-in Controller : SPLC780D
- (4) LED Backlight : LED/Yellow-Green

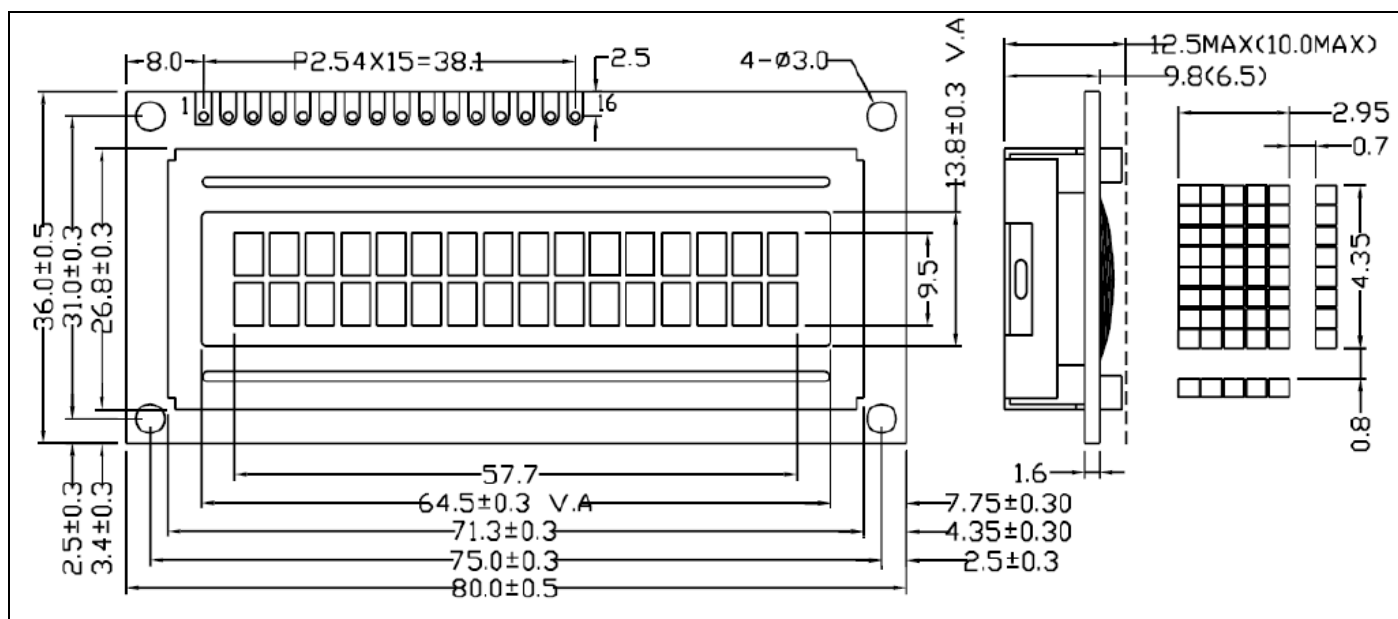
5. MECHANICAL SPECIFICATIONS

ITEM	SPECIFICATIONS	UNIT
MODULE SIZE	80.00(W)X36.00(H)X12.50MAX(D)	mm
VIEWING AREA	64.50(W)X13.80(H)	mm
ACTIVE AREA	57.70(W)X9.50(H)	mm
CHARACTER SIZE	2.95(W)X4.35(H)	mm
CHARACTER PITCH	3.65(W)X5.15(H)	mm
BACKLIGHT	YELLOW-GREEN	--
ASSY.TYPE	COB	--
WEIGHT	TBD	--

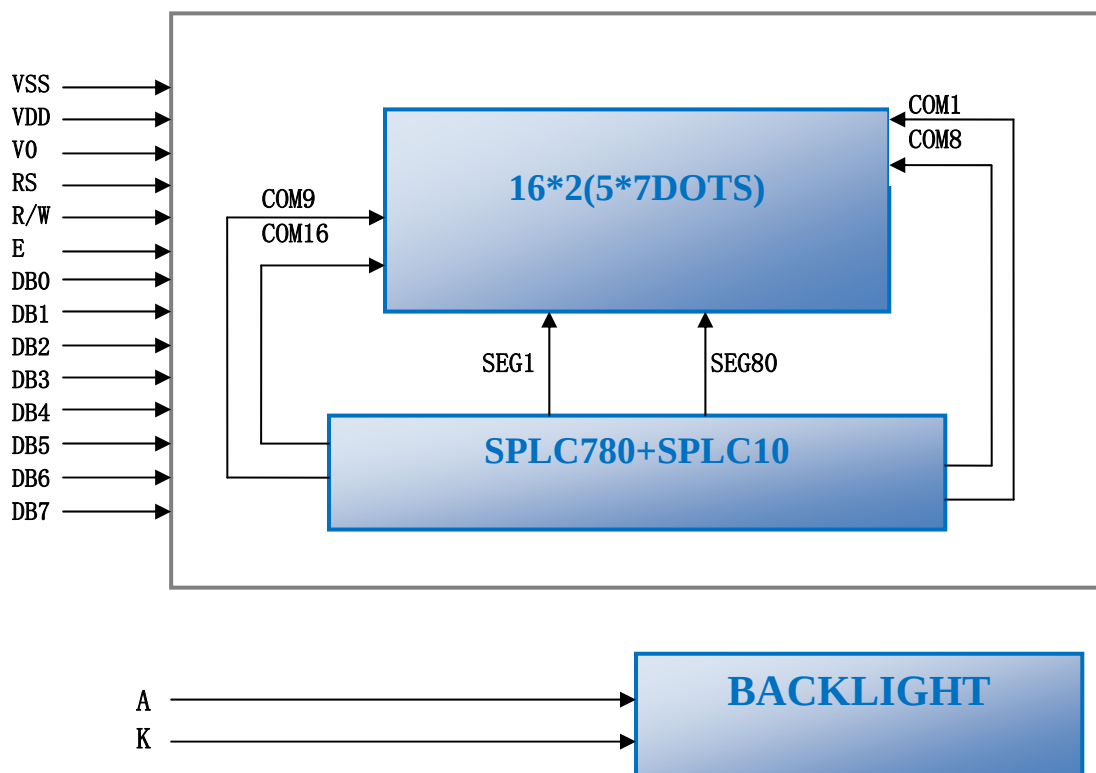
NOTES :

LCM should be grounded during handling LCM.

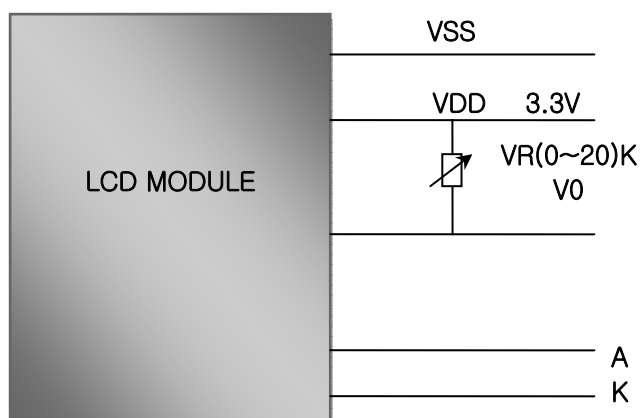
6. OUTLINE DIMENSIONS



7. BLOCK DIAGRAM



8. APPLICATION CIRCUIT



9. ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

CHARACTERISTICS	SYMBOL	STANDARD VAULE			UNIT
		MIN	TYP	MAX	
Power Supply Voltage(1)	VDD	0.3	--	+7.0	V
Power Supply Voltage(2)	LCD	VDD-15.0	--	VDD+0.3	V
Input Voltage	VIN	-0.3	--	VDD+0.3	V
Operating Temperature	TOPR	-10	--	+60	°C
Storage Temperature	TSTG	-20	--	+70	°C

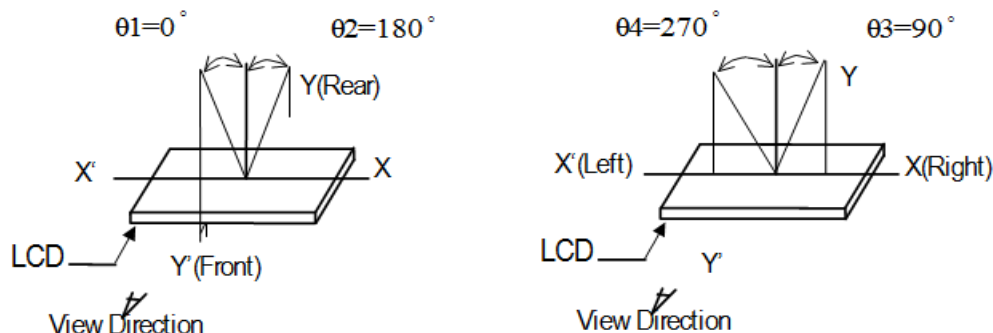
10. ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage (Logic)	VDD-VSS	-	4.8	5.0	5.2	V
Supply Voltage (LCD)	VDD-V0	Ta=+25°C	4.5	4.8	4.9	V
Input Signal Voltage	V-IH	“H” Level	0.8VDD	-	VDD	V
	V-IL	“L” Level	VSS	-	0.2VDD	V
Output Signal Voltage	V-OH	“H” Level	0.8VDD	-	VDD	V
	V-OL	“L” Level	VSS	-	0.2VDD	V
Supply Current (Logic)	IDD	VDD=3.3V		3	5	mA
Backlight Voltage	V-BL	-	4.1	4.2	4.3	V
Backlight Current	I-BL	-	60	90	120	mA

11. OPTICAL CHARACTERISTICS

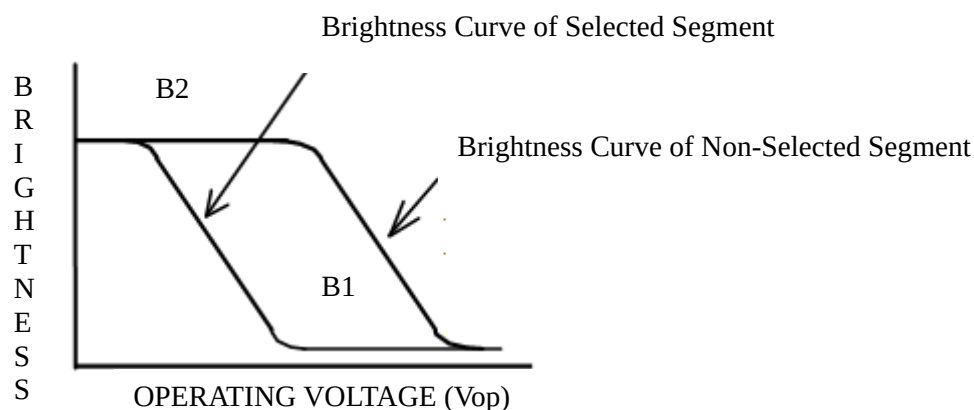
ITEM		SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Response Time ⁽³⁾		Tr	-	-	110	220	ms
		Tf	-	-	260	520	ms
Contrast Ratio ⁽²⁾		Cr	-	-	3	-	-
Viewing Angle ⁽¹⁾	$\theta = 90^\circ$	-	$Cr \geq 2$	-	-	30	deg
	$\theta = 270^\circ$	-		-	-	30	deg
	$\theta = 0^\circ$	-		15	-	105	deg
	$\theta = 360^\circ$	-		-	-	-	deg

11-1 DEFINITION OF VIEWING ANGLE

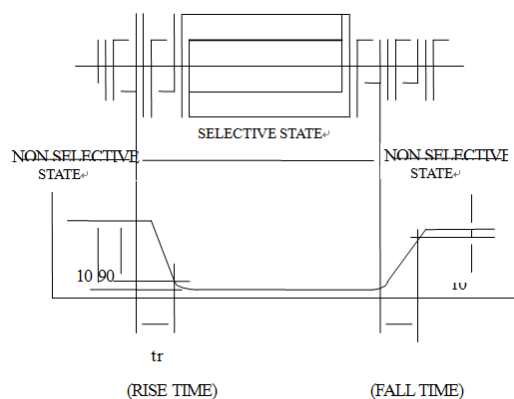


11-2 DEFINITION OF CONTRAST RATIO

$$CR = \frac{\text{Brightness of Non-selected Segment (B2)}}{\text{Brightness of Selected Segment (B1)}}$$



11-3 DEFINITION OF RESPONSE TIME



12. BACKLIGHT CHARACTERISTICS**12-1 LCD Module with LED Backlight**

ITEM	SYMBOL	CONDITION	MIN	MAX	UNIT
Forward Current	If	Ta=25°C	-	120	mA
Reverse Voltage	VR	Ta=25°C	-	5	V
Power Dissipation	PO	Ta=25°C	-	0.6	W
Operating Temperature	TOP		-20	70	°C
Storage Temperature	TST		-30	80	°C

12-2 Electro-Optical Characteristics

(Ta=25°C)

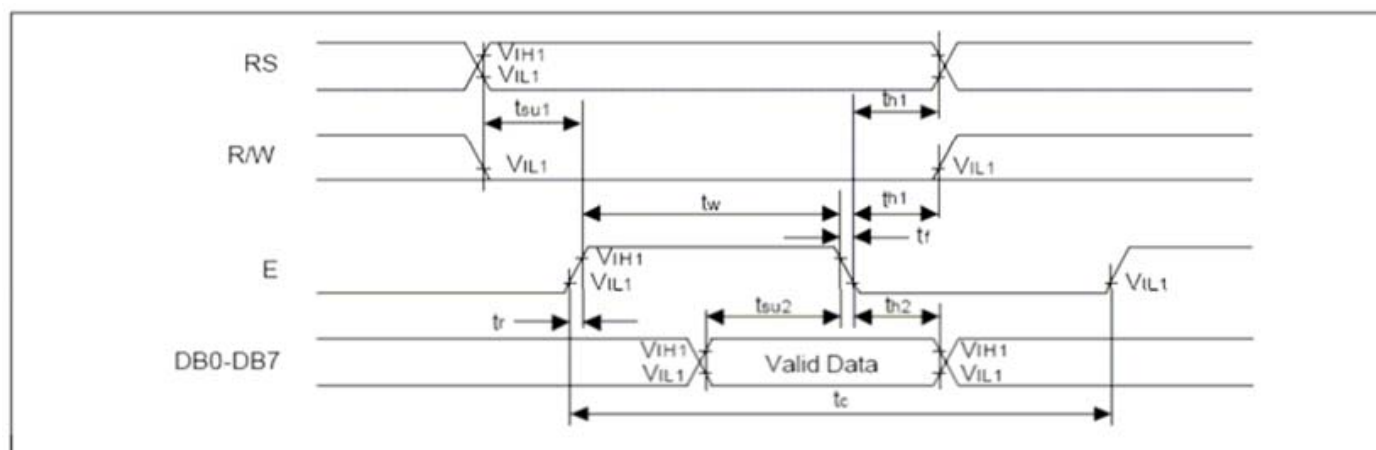
ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Forward Voltage	VF	IF=120mA	4.0	4.2	4.4	V
Reverse Current	IR	VR=8V	-	-	0.2	mA
Average Brightness (with LCD)*1	IV	IF=120mA	-	-	-	cd/m ²
Uniformity*1 (with LCD)*1	△B	IF=120mA	70%	-	-	*2
Color	YELLOW-GREEN					

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

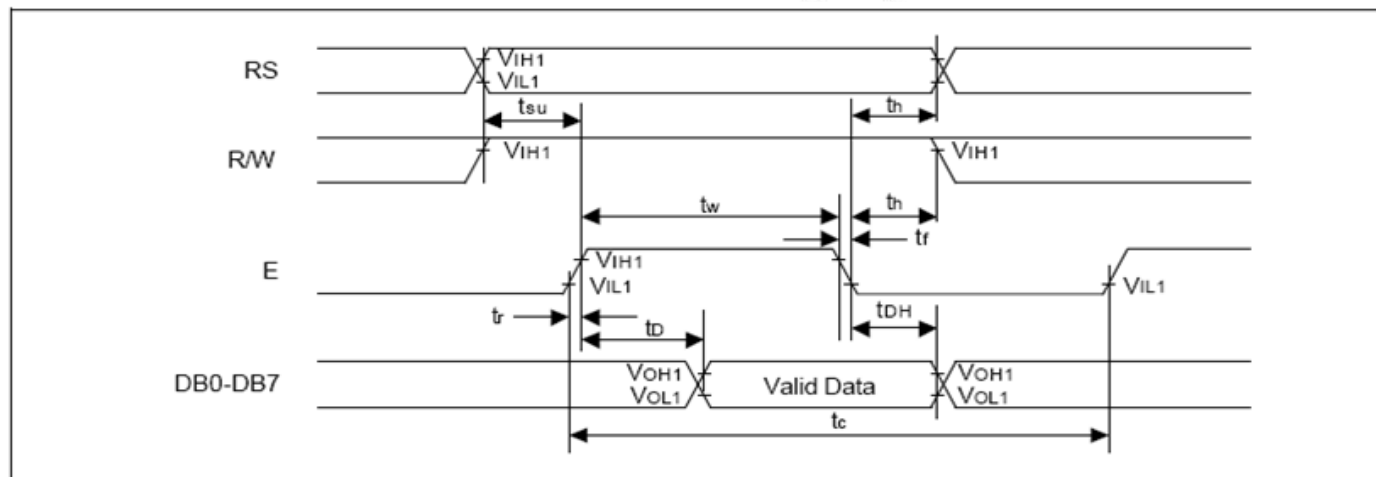
*2 $\Delta B = B(\min)/B(\max)$

13. TIMING CHARACTERISTICS

MODE	CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
Write Mode	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	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	-	-	



Write Mode Timing Diagram



Read Mode Timing Diagram

14. PIN ASSIGNMENT

PIN NO.	FUNCTION DESCRIPTIONS	SYMBOL
1	Ground	VSS
2	Supply Voltage for Logical Circuit	VDD
3	Voltage Level for LCD Driving	V0
4	Used as Register Selection Input. When RS="High", Data Register is Selected. When RS="Low". Instruction Register is Selected.	RS
5	Used as Read/Write Selection Input. When R/W="High", Read Operation. When R/W="Low", Write Operation.	R/W
6	Used as Read/Write Enable Signal.	E
7~10	In 8-bit bus mode, used as low order bidirectional data bus. In 4-bit bus mode, open these pins.	D0~D3
11~14	In 8-bit bus mode, used as high order bidirectional data bus. In 4-bit bus model, used as both high and low order. DB7 used for Busy Flag Output.	D4~D7
15	Connect to the Positive of Backlight	A
16	Connect to the Negative of Backlight	K

15. RELIABILITY

ITEM	CONDITIONS	CRITERION
Operating Temperature	High Temperature +60°C 200hrs	No defect in displaying and operational function
	Low Temperature -10°C 200hrs	
Storage Temperature	High Temperature +70°C 200hrs	No defect in displaying and operational function
	Low Temperature -20°C 200hrs	
Humidity	50°C 90%RH 96hrs	No defect in displaying and operational function
Vibration	*10-22Hz → 1.5mmp-p *22-500Hz → 1.5G *Total 0.5hrs	No defect in displaying and operational function
Static Electricity	VS=800V, RS=1.5K, CS=100pF 1time	No defect in displaying and operational function

16. PRECAUTION FOR USE

The following precaution 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.