ALL SHORE INDUSTRIES

ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR

LIQUID CRYSTAL DISPLAY MODULE

MODULE # : ASI-A-32024AS-GF-EWS/W

(1) NUMBER OF DOTS ---------- 320 W * 240 H DOTS

(2) MODULE SIZE ---------- 167.5 W * 109.0 H * 13.0 T (max) mm

(3) EFFECTIVE AREA ---------- 120.5 * 92.0 W(min) H mm

(4) ACTIVE AREA---------- 115.17 W * 86.37 H mm

(5) DOT SIZE ---------- 0.33 W * 0.33 H mm

(6) DOT PITCH----------0.36 W * 0.36 H mm

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RECORD OF REVISION

DATE	PAGE	SUMMARY
2003/11/24	6	6.Modify the power supply current TYP. : 20.0 → 70.0 MAX. : 30.0 → 80.0
	8	8.Modify the outline dimension

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3. General specifications

3.1 General specifications

PLEASE REFER TO:

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-10000)".

3.2 This individual specification is prior to general specifications

4. Mechanical data

(1)	NUMBER OF DOTS	320 W * 240 H DOTS
(2)	MODULE SIZE	167.5 W * 109.0 H * 13.5 T (max) mm
(3)	EFFECTIVE AREA	122.0 W * 92.0 H mm
(4)	ACTIVE AREA	115.17 W * 86.37 H mm
(5)	DOT SIZE	0.33 W * 0.33 H mm
(6)	DOT PITCH	0.36 W * 0.36 H mm
(7)	VIEWING DIRECTION	6 OR 12 O'CLOCK
(8)	LCD TYPE	STN BLUE NEGATIVE
(9)	LED BACKLIGHT COLOR	WHITE

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5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

I T E M	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	V_{DD}-V_{SS}	0	5.5	V	---
INPUT VOLTAGE	V_I	V_{SS}	V_{DD}	V	---
STATIC ELECTRICITY	---	---	100	V	NOTE (1)
POWER SUPPLY FOR CCFL BACKLIGHT	V_S	---	AC1000	V_{rms}	---
	f_{FL}	---	55.0	KHz	---
STARTING VOLTAGE FOR CCFL BACKLIGHT	Vstart1	AC550	---	V_{rms}	Ta = 25℃
	Vstart2	AC700	---	V_{rms}	Ta = 25℃
POWER SUPPLY FOR LED	V_{LED}	---	5.0	V	---

NOTE (1): ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200PF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

5.2 Environmental absolute maximum ratings

I T E M	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20℃	70℃	-20℃	70℃	---
HUMIDITY	NOTE (2)		NOTE (2)		NO CONDENSATION
VIBRATION NOTE (3)	---	0.5G	---	2G	10～300HZ XYZ DIRECTIONS 1 Hr EACH
SHOCK NOTE (3)	---	3G	---	50G	10 msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		---

NOTE (2): Ta ≦ 70℃: 75% RH MAX.
Ta > 70℃: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 75% RH AT 70℃.

NOTE (3): 1G = 9.8 m/s^2

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6. Electrical characteristics

Ta = 25° VDD = 5.0 ±0.25 V

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR CIRCUIT	VDD-VSS	----------		4.75	5.0	5.25	V
INPUT VOLTAGE	VIH	H LEVEL		0.8VDD	------	VDD	V
	VIL	L LEVEL		VSS	------	0.2VDD	V
1 POWER SUPPLY CURRENT, NOTE (1)	IDD	VDD-VSS = 5.0V		------	70.0	80.0	mA
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(2) NOTE(3)-A	VO-VSS	DUTY =1/240 Φ=10° NOTE(4)	Ta=-20°C	------	24.3	------	V
			Ta= 25°C	------	22.9	------	V
			Ta= 70°C	------	21.1	------	V
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(2) NOTE(3)-B	VO-VSS	DUTY =1/240 Φ=10° NOTE(4)	Ta=-20°C	------	24.9	------	V
			Ta= 25°C	------	23.5	------	V
			Ta= 70°C	------	21.7	------	V
CCFL LAMP	VFL	fFL = 35KHz		------	270	------	Vrms
	IFL	VFL = 270 Vrms fFL = 35 KHz		------	5.0	------	mArms
CCFL LIFETIME	------	VFL = 270 Vrms fFL = 35 KHz		------	30,000	------	hr
FLM FREQUENCY	fFLM	----------		70	75	80	Hz
POWER SUPPLY CURRENT FOR LED BACKLIGHT	ILED	VLED= +4.0 V		------	120.0	160.0	mA

NOTE (1): THE DISPLAY PATTERN IS ALL "ON", OR ALL "OFF"

(2): RECOMMENDED LCD DIRVING VOLTGE MAY FLUCTUATE ABOUT ± 0.5V BY EACH MODULE.

(3): RECOMMENDED LCD DIRVING VOLTGE FOR DEFFERENT LCD TYPE

	LCD TYPE	LCD COLOR
A	FSTN	BLACK(NEGATIVE)
B	FSTN	WHITE(POSITIVE)
	STN	GRAY / YELLOW-GREEN / BLUE(NEGATIVE)

(4): $\theta = 0°$: VIEWING ANGLE AT 6 O'CLOCK

$\theta = 180°$: VIEWING ANGLE AT 12 O'CLOCK

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7. Optical characteristics

Ta = 25° V_{DD} = 5.0V

STN TYPE LCD Ta = 25℃

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	3.0	4.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

FSTN TYPE LCD Ta = 25℃

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	4.0	5.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

Brightness for backlight

Symbol	Condition		MIN.	TYP.	MAX.	UNIT	Backlight Type	Note
B	V_{FL}=270Vrms f_{FL}=35KHz STN/FSTN POSITIVE	Dots all on	------	5	------	cd/m²	CCFL	Note(2) Note(3)
		Dots all off	------	60	------			
	V_{FL}=270Vrms f_{FL}=35KHz STN/FSTN NEGATIVE	Dots all on	------	160	------			
		Dots all off	------	60	------			
	Φ = 0° θ = 0° STN/FSTN POSITIVE	Dots all on	------	5	------		LED (WHITE)	
		Dots all off	------	160	------			
	Φ = 0° θ = 0° STN/FSTN NEGATIVE	Dots all on	------	160	------			
		Dots all off	------	5	------			

Note (1): θ = 0° WHEN VIEWING ANGLE AT 6 O'CLOCK
θ = 180° WHEN VIEWING ANGLE AT 12 O'CLOCK
(2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.
(3): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

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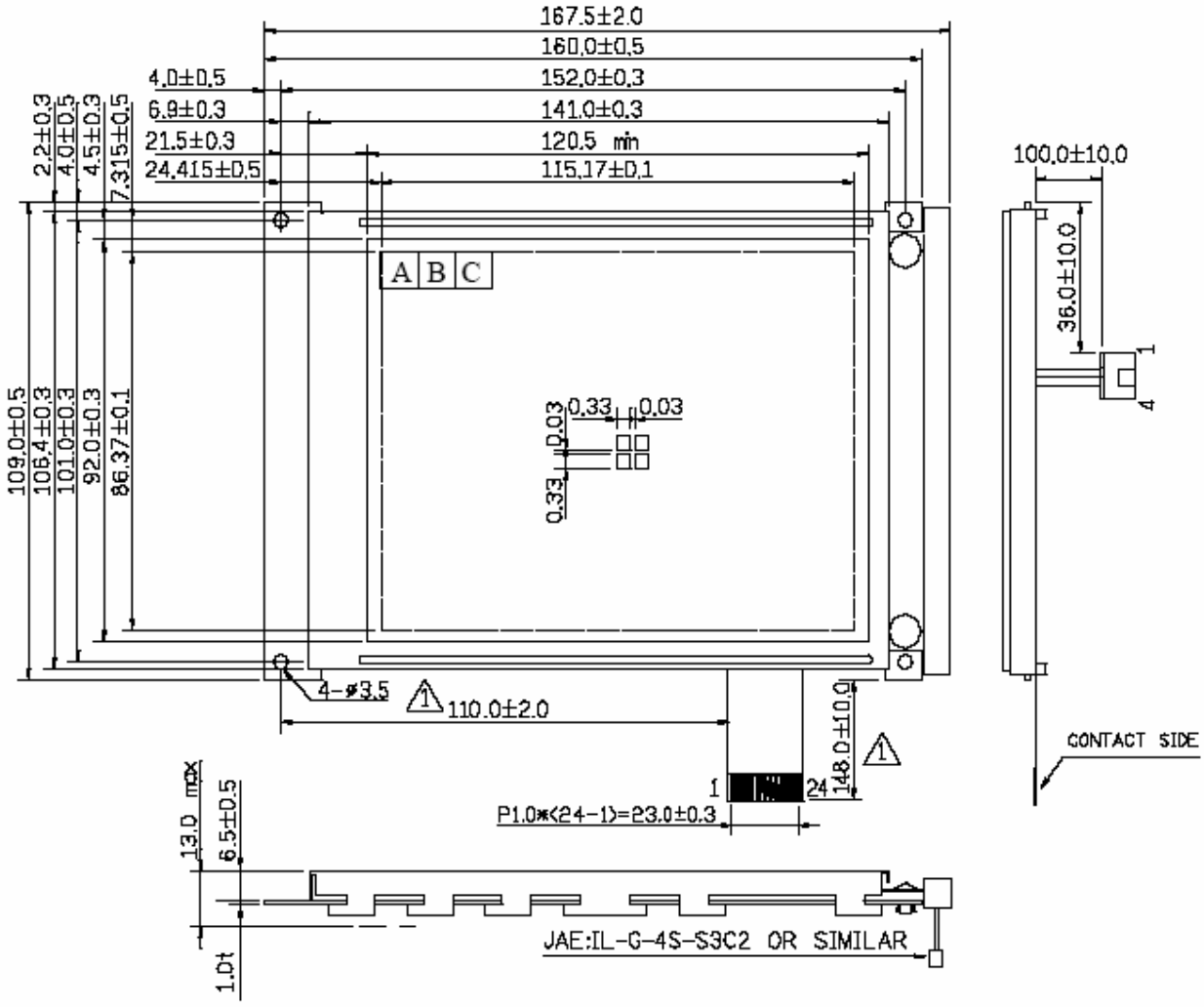
8. Outline dimension



NOTE :
1.UNIT : mm
2.SCALE : NTS

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7.1 Interface

(a) Pin Assignment

PIN NO.	SYMBOL	FUNCTION
1	V_{SS}	POWER SUPPLY (GND)
2	V_{DD}	POWER SUPPLY
3	V_O	OPERATING VOLTAGE FOR LCD DRIVING
4	A_O	DATA TYPE SELECTION
5	$\overline{WR}(R/\overline{W})$	(When 8080-series) : $\overline{WR}$ IS (L) (When 6800-series) : Read mode : $R/\overline{W}$ IS (H) Write mode : $R/\overline{W}$ IS (L)
6	$\overline{RD}$/E	$\overline{RD}$:(When to 8080-series) E : (When to 6800-series)
7	D0	DATA INPUT/OUTPUT
8	D1	DATA INPUT/OUTPUT
9	D2	DATA INPUT/OUTPUT
10	D3	DATA INPUT/OUTPUT
11	D4	DATA INPUT/OUTPUT
12	D5	DATA INPUT/OUTPUT
13	D6	DATA INPUT/OUTPUT
14	D7	DATA INPUT/OUTPUT
15	$\overline{CS}$	L:CHIP SELECTION
16	$\overline{RES}$	L: RESET
17	V_{EE}	POWER SUPPLY FOR LCD DRIVING (OUTPUT)
18	SEL1	8080 OR 6800 FAMILY INTERFACE SELECT L:80 SERIES , H:68 SERIES
19	F.G	FRAME GROUND
20	N.C	NO CONNECTION
21	N.C	NO CONNECTION
22	N.C	NO CONNECTION
23	N.C	NO CONNECTION
24	N.C	NO CONNECTION

(b) CCFL Connector

PIN NO.	SYMBOL	FUNCTION
1	V_{CCFL}	POWER SUPPLY VOLTAGE FOR CCFL
2	N.C	NO CONNECTION
3	N.C	NO CONNECTION
4	V_{CCFL}	POWER SUPPLY VOLTAGE FOR CCFL

(c) LED Connector

PIN NO.	SYMBOL	FUNCTION
1	A	POWER SUPPLY VOLTAGE FOR LED(+)
2	N.C	NO CONNECTED
3	N.C	NO CONNECTED
4	K	POWER SUPPLY VOLTAGE FOR LED(-)

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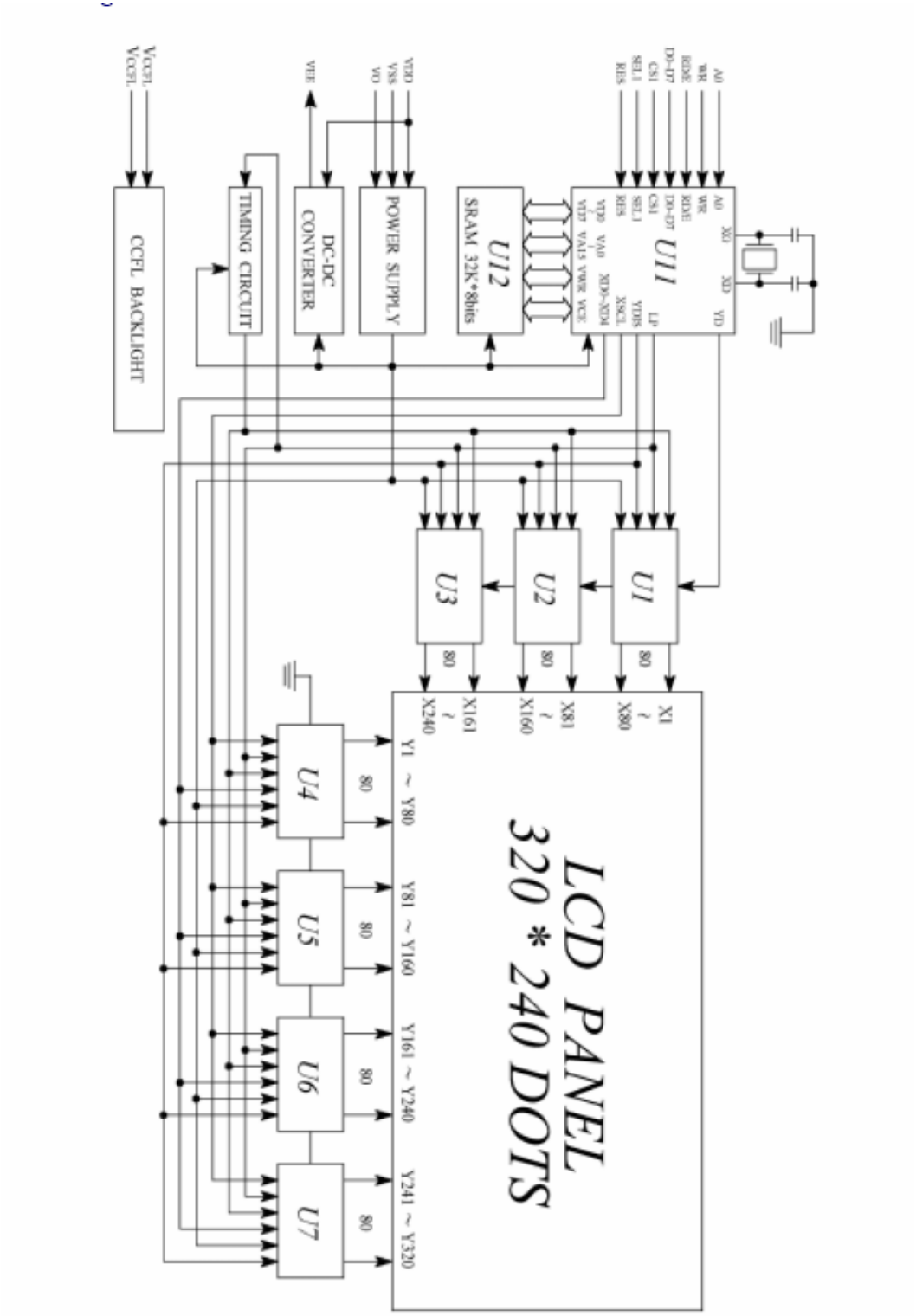
8.2 Block diagram



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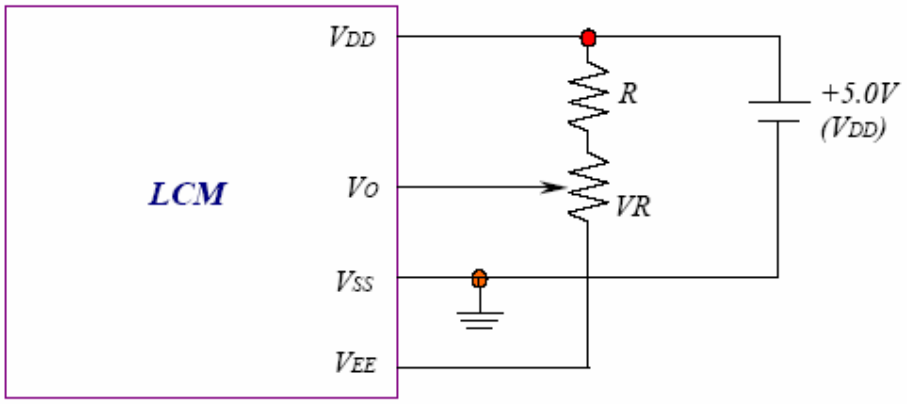
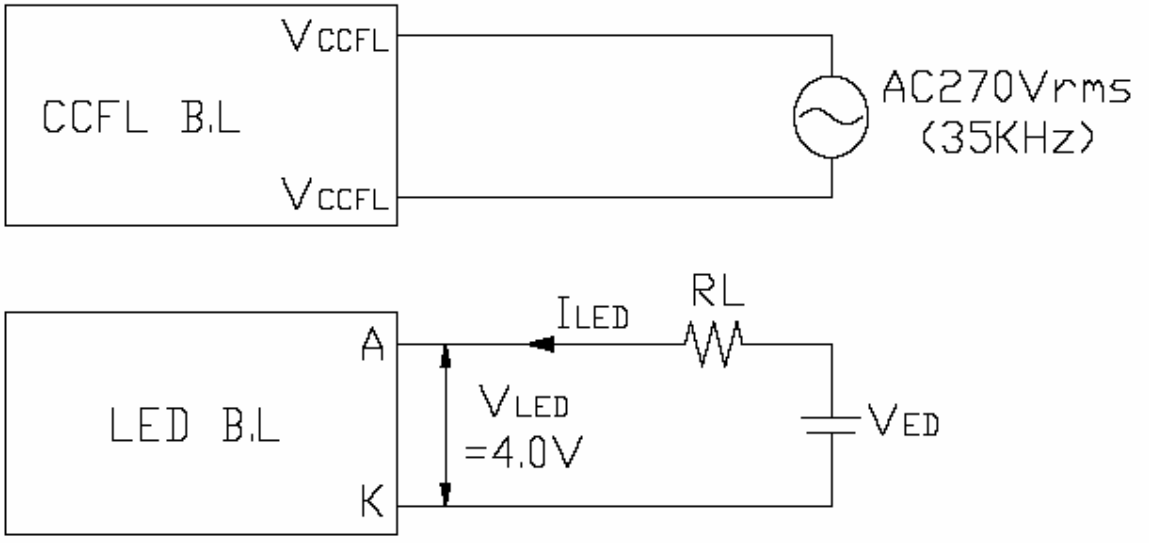
10 Power supply for LCM



Vo–Vss: LCD DRIVING VOLTAGE
RECOMMEND RESISTOR R: VDD-Vo≧1.5V
VR: 200KΩ

10.1 Power supply for backlight



RL≧(VED-VLED) / ILED , ILED ≤ 160.0 mA (max)