



All Shore Industries, Inc.

PART NO. : ASI-1303BW-G SERIES

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RECORD OF REVISION

DATE	PAGE	SUMMARY
2007/01/12	P3	3.Remove (5) VIEWING ANGLE
	P6	6.Modify the condition of V _{DD} -V _{SS}
		6. Modify the Recommended LCD driving voltage
		6.Remove NOTE(2)
	P7	7.Modify the optical characteristic
		7.Remove NOTE(1)
P12	10.Modify the Power Supply of LCM	
2007/5/8	P5	5. Modify POWER SUPPLY FOR LED
	P6	6. Modify the POWER SUPPLY CURRENT FOR LED TYP.15mA→ 30mA , MAX.20mA→ 40mA
	P6	6. Modify NOTE(3) VLED 5.0V→ 4.0V
	P12	10. Modify 10.1 Power supply for backlight

③

3. General specifications

3.1 General specifications

PLEASE REFER TO:

- a. "CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-10000)"
- b. "CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (IC-NT7538)"

3.2 This individual specification is prior to general specifications

4. Mechanical data

- (1) NUMBER OF DOT----- 132 W* 33 H DOTS
- (2) MODULE SIZE ----- (a)WITH B/L 55.45 W * 25.9 H * 5.85 T mm
(b)WITHOUT B/L 51.2 W * 23.8 H * 2.9 T(max) mm
- (3) EFFECTIVE AREA ----- 47.8 W * 15.4 H mm
- (4) ACTIVE AREA ----- 42.22 W * 10.54 H mm
- (5) DOT SIZE ----- 0.3 W * 0.3 H mm
- (6) DOT PITCH----- 0.32 W * 0.32 H mm
- (7) CONTROLLER / DRIVER IC ----- NT7538 (NOVATEK)
- (8) PROCESS & MATERIALS ----- RoHS COMPLIANT

5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

<i>I T E M</i>	<i>SYMBOL</i>	<i>MIN.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>COMMENT</i>
POWER SUPPLY FOR LOGIC	V _{DD} -V _{SS}	-0.3	4.0	V	-----
BOOSTER OUTPUT VOLTAGE	V _{OUT}	-0.3	15.0	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE(1)
③ 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>I T E M</i>	<i>OPERATING</i>		<i>STORAGE</i>		<i>COMMENT</i>
	<i>MIN.</i>	<i>MAX.</i>	<i>MIN.</i>	<i>MAX.</i>	
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 >= 50° 90%RH MAX.

Ta > 50°: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90% RH AT 50°. (80% RH AT 60□)

NOTE (3): 1G = 9.8 m/s²

6. Electrical characteristics

$T_a = 25^\circ$

<i>ITEM</i>	<i>SYMBOL</i>	<i>CONDITION</i>		<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>
① POWER SUPPLY VOLTAGE FOR CIRCUIT	VDD-VSS	2X,3X boosting		1.8	-----	3.6	V
		4X boosting		1.8	-----	3.3	
		5X boosting		1.8	-----	2.8	
INPUT VOLTAGE (H LEVEL)	V _{IH}	-----		0.8V _{DD}	-----	V _{DD}	V
INPUT VOLTAGE (L LEVEL)	V _{IL}	-----		V _{SS}	-----	0.2V _{DD}	V
OUTPUT VOLTAGE (H LEVEL)	V _{OH}	I _{OH} = -0.5 mA		0.8V _{DD}	-----	V _{DD}	V
OUTPUT VOLTAGE (L LEVEL)	V _{OL}	I _{OL} = 0.5 mA		V _{SS}	-----	0.2V _{DD}	V
POWER SUPPLY CURRENT	I _{DD}	V _{DD} = 3.0 V		-----	150	255	uA
① RECOMMENDED LCD DRIVING VOLTAGE,NOTE(1)	V _O -V _{SS} DUTY =1/33 BIAS=1/6	T _a =-20°	Φ=10°(-10°)	-----	6.1	-----	V
		T _a = 25°	Φ=10°(-10°)	-----	6.0	-----	V
		T _a = 70°	Φ=10°(-10°)	-----	5.6	-----	V
③ POWER SUPPLY CURRENT FOR LED	I _{LED}	V _{LED} =4.0V,NOTE(3)A		-----	15	20	mA
		V _{LED} =4.0V,NOTE(3)B		-----	30	40	mA

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ±0.5V BY EACH MODULE.

(3):

<i>TYPE</i>	<i>VLED</i>	<i>LED COLOR</i>
A	4.0 V	WHITE、BLUE、PURE GREEN
③ B	4.0 V	AMBER、YELLOW-GREEN、ORANGE、RED



7. Optical characteristics

Ta = 25° V_O-V_{SS} = 6.0V

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>NOTE</i>
VIEWING ANGLE	Φ2-Φ1	K = 2.0 θ = 0°	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ=10°(-10°) θ = 0°	3.0	4.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ=10°(-10°) θ = 0°	----	200	350	ms	NOTE(2)
	tf (fall)	Φ=10°(-10°) θ = 0°	----	300	400	ms	NOTE(2)

Brightness for backlight

<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>BACKLIGHT TYPE</i>	<i>NOTE</i>
B	Φ = 0° θ = 0°	5.0	-----	-----	cd/m ²	TYPE A(LED COLOR: WHITE, BLUE, PURE GREEN)	NOTE(2)
	Ta = 25 □	4.0	-----	-----		TYPE B(LED COLOR: AMBER, YELLOW-GREEN , ORANGE, RED)	NOTE(3)

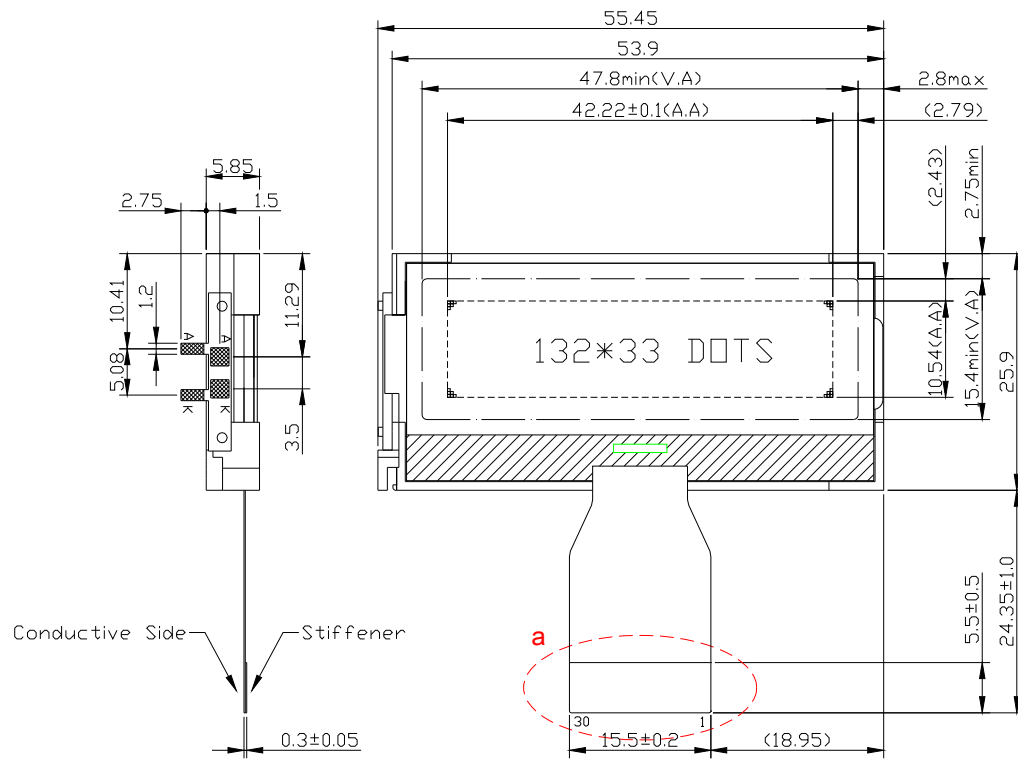


NOTE(2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

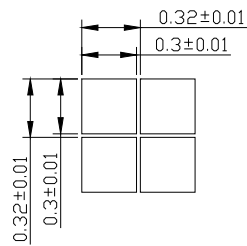
(3): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

8. Outline dimension

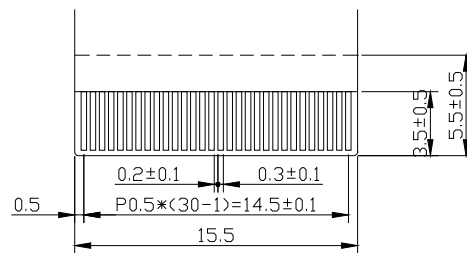
(a) With Backlight



Detail of DOTS :



Detail of "a" :

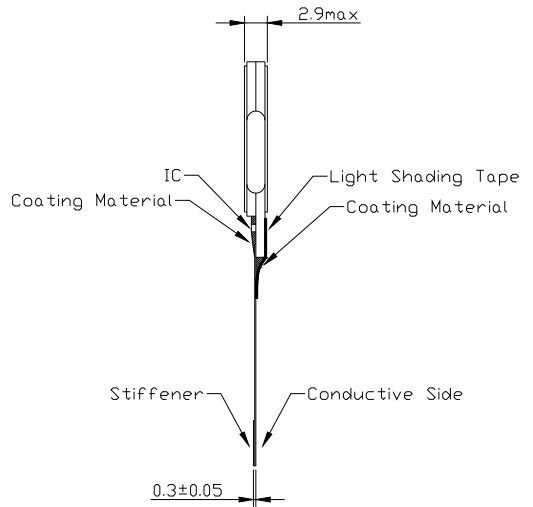
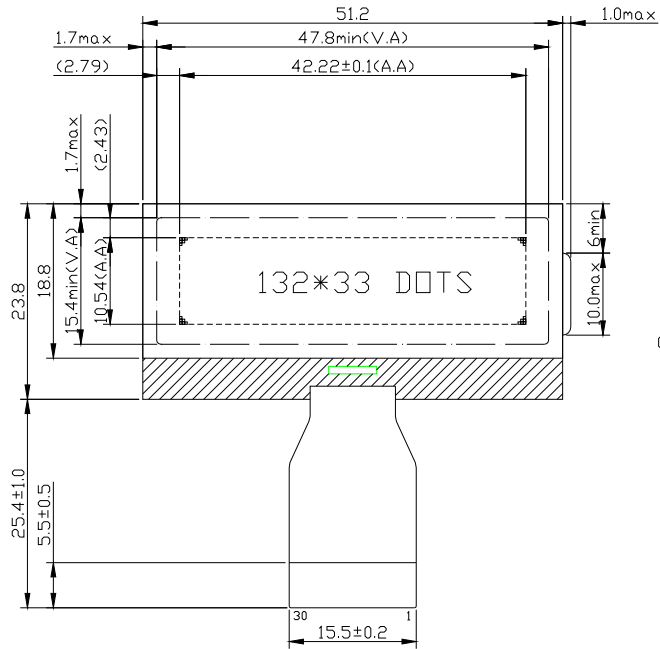


NOTE :

1. Unit : mm

2. No Specified Tolerance : ± 0.2

(b) Without Backlight

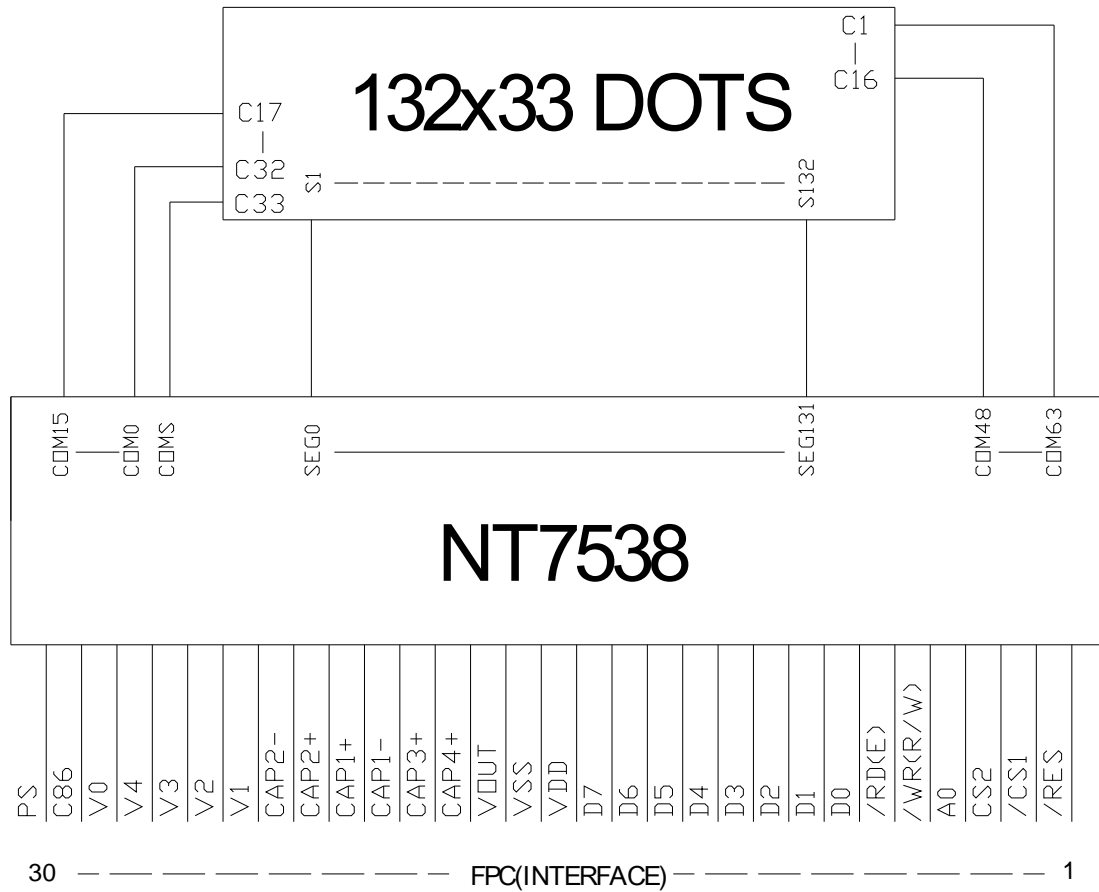


8.1 Interface connection

<i>PIN NO.</i>	<i>SYMBOL</i>	<i>FUNCTION</i>
1	$\overline{\text{RES}}$	“L” : RESET
2	$\overline{\text{CS1}}$	CHIP SELECT , WHEN $\overline{\text{CS1}}$ =“L” AND CS2 =”H”→ACTIVE
3	CS2	
4	A0	“L” : CONTROL DATA “H” : DISPLAY DATA
5	$\frac{\overline{\text{R/W}}}{\overline{\text{WR}}}$	(When 8080-series) : $\overline{\text{WR}}$ IS “L” (When 6800-series) : Read mode → $\overline{\text{R/W}}$ IS “H” Write mode → $\overline{\text{R/W}}$ IS “L”
6	E $\overline{\text{RD}}$	$\overline{\text{RD}}$: (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(SCL)	DATA INPUT/OUTPUT , SCL WHEN PS=”L”
14	D7(SI)	DATA INPUT/OUTPUT , SI WHEN PS=”L”
15	VDD	POWER SUPPLY INPUT
16	VSS	GROUND
17	VOUT	DC-DC VOLTAGE CONVERTER OUTPUT
18	CAP4+	INTERNAL DC/DC VOLTAGE CONVERTER
19	CAP3+	INTERNAL DC/DC VOLTAGE CONVERTER
20	CAP1-	INTERNAL DC/DC VOLTAGE CONVERTER
21	CAP1+	INTERNAL DC/DC VOLTAGE CONVERTER
22	CAP2+	INTERNAL DC/DC VOLTAGE CONVERTER
23	CAP2-	INTERNAL DC/DC VOLTAGE CONVERTER
24	V1	LCD DRIVER SUPPLY VOLTAGES. THE VOLTAGE DETERMINED BY LCD CELL IS IMPEDANCE-CONVERTED BY A RESISTIVE DRIVER OR AN OPERATIONAL AMPLIFIER FOR APPLICATION. VOLTAGES SHOULD HAVE THE FOLLOWING RELATIONSHIP: $V_0 \square V_1 \square V_2 \square V_3 \square V_4 \square V_{SS}$
25	V2	
26	V3	
27	V4	
28	V0	
29	C86	“H” → 6800 SERIES “L” → 8080 SERIES
30	PS	“H” → PARALLEL DATA INPUT “L” → SERIAL DATA INPUT

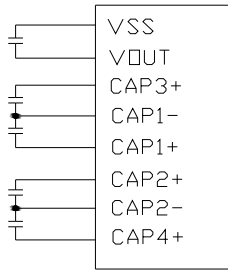
<i>PIN NO.</i>	<i>SYMBOL</i>	<i>FUNCTION</i>
-----	A(+)	POWER SUPPLY FOR LED ANODE
-----	K(-)	POWER SUPPLY FOR LED CATHODE

9. Block diagram

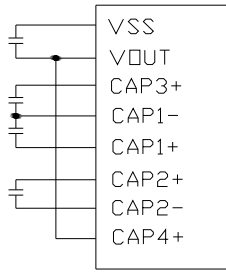




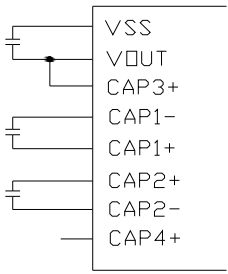
10. Power supply for LCM



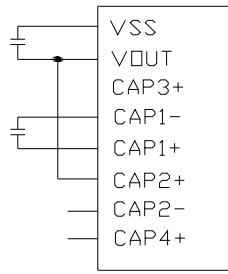
5x step-up voltage circuit



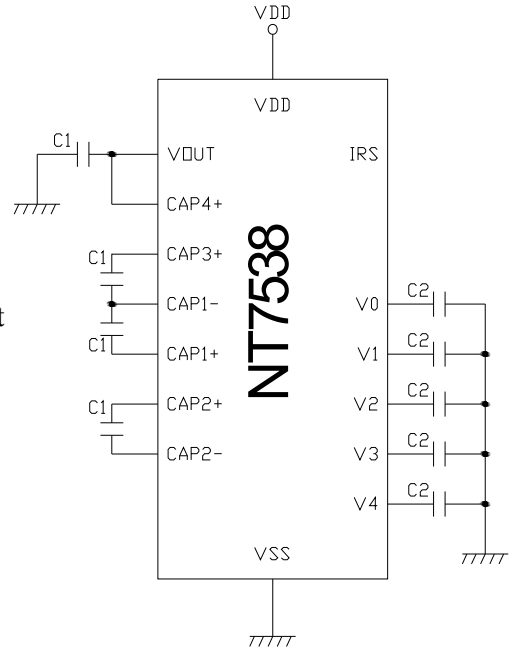
4x step-up voltage circuit



3x step-up voltage circuit



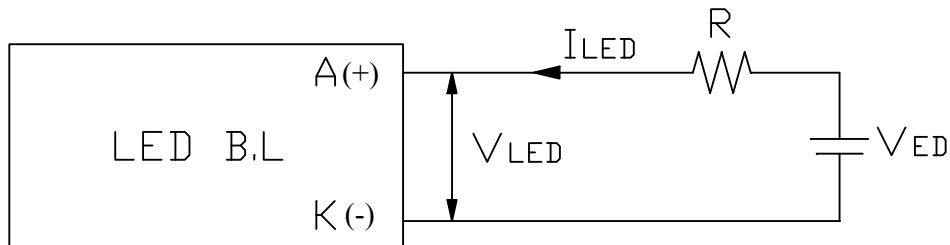
2x step-up voltage circuit



NOTE:

1. RECOMMENDED VALUE OF CAPACITORS: C1=1.0~4.7uF
C2=0.47~2.2uF
2. $V_o = (1 + R_a/R_b) * (1 - (63 - X)/162) * V_R$, X=0,1,2,...,62,63

3 10.1 Power supply for backlight



TYPE	VLED	ILED (max)	THE VALUE OF R	LED COLOR
A	4.0 V	20 mA	$(V_{ED} - V_{LED}) / I_{LED}$	WHITE, BLUE, PURE GREEN
B	4.0 V	40 mA		AMBER, YELLOW-GREEN, ORANGE, RED