EXAMINED BY :	EMERGING DISPLAY	FILE NO . CAS-10266
		ISSUE : MAR.26,2003
APPROVED BY:	TECHNOLOGIES CORPORATION	TOTAL PAGE : 8
		VERSION : 3

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO . :

32F40(LED TYPES)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL NO. 32F40(LED TYPES)	VERSION 3
RECORDS OF REVISION	DOC . FIRST ISSUE DEC.06,2001	

DATE	REVISED PAGE NO.	SUMMARY
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MAR.26,2003	4	5. OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITION	MIN .	TYP.	MAX .	UNIT
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD – VSS = 5 . 0 V	—	40.0	—	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD – VO = 2 2 . 5V	—	2.5	—	mA

→

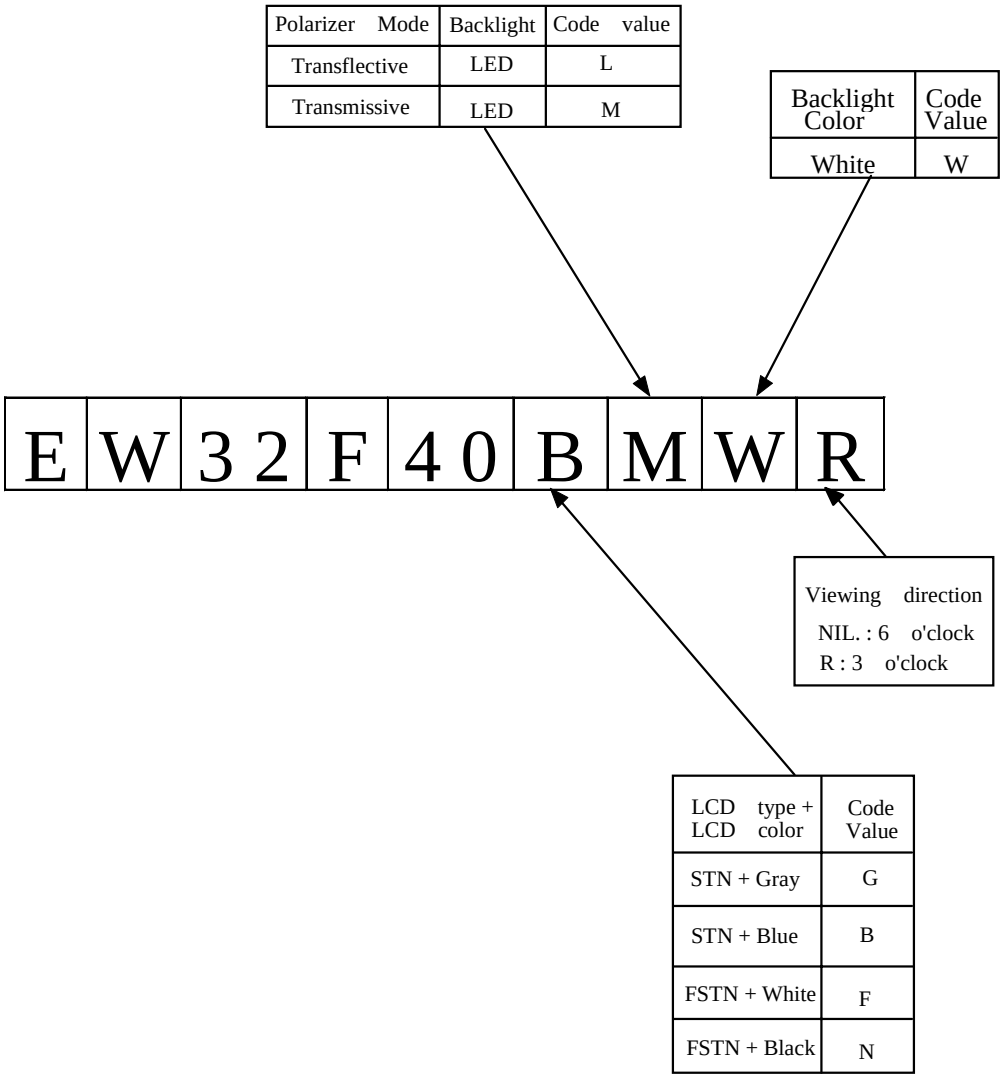
PARAMETER	SYMBOL	CONDITION	MIN .	TYP.	MAX .	UNIT
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD – VSS = 5 . 0 V	—	22	40	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD – VO = 2 2 . 5V	—	6	8	mA

I T E M	SYMBOL	CONDITION	MIN .	TYP .	MAX.	UNIT	NOTE
BRIGHTNESS OF BACKLIGHT	B	VLED – VLSS = 5.0 V	(7)	—	—	cd / m²	1 , 2
			(5)	—	—		1 , 3

↓

I T E M	SYMBOL	CONDITION	MIN .	TYP .	MAX.	UNIT	NOTE
BRIGHTNESS	B	VLED – VLSS = 5.0 V	9.8	12.8	—	cd / m²	1 , 2
			6.5	8.5	—		1 , 3

NUMBERING SYSTEM



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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

EU-001A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER :
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

EU-SED1335

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS.

2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF DOTS	320W * 240H DOTS
(2)	MODULE SIZE	167.1W * 109.0H * 11.0D mm
(3)	EFFECTIVE AREA	120.0W * 90.0H mm
(4)	ACTIVE AREA	115.17W * 86.37H mm
(5)	DOT SIZE	0.33W * 0.33H mm
(6)	DOT PITCH	0.36W * 0.36H mm
(7)	LCD TYPE *	
(8)	DRIVING METHOD	1/240 DUTY MULTIPLEX DRIVE
(9)	BACKLIGHT	LED

* PLEASE REFER TO NUMBERING SYSTEM.

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVING	VDD – VEE	0	30.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
LED POWER VOLTAGE	VLED	—	6	V	

NOTE (1) : TEST METHOD AND CONDITIONS :
AFTER CHARGING UP 200 PF CAPACITOR BY STATED VOLTAGE, THE CAPACITOR IS CONNECTED WITH INTERFACE PINS OF THE MODULE.

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20°C	70°C	-30°C	80°C	NOTE (2), (3)
HUMIDITY	—	85 % RH	—	85 % RH	WITHOUT CONDENSATION
VIBRATION	—	2.45 m/s^2 (0.25 G)	—	11.76 m/s^2 (1.2 G)	10~100 HZ XYZ DIRECTIONS 1 Hr. EACH
SHOCK	—	29.4 m/s^2 (3 G)	—	490.0 m/s^2 (50 G)	1 Mseconds XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -30°C : 48HR MAX.
80°C : 168HR MAX.

NOTE (3) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE.

4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C VDD-VSS = 5.0 V VEE-VSS = -22.0V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD – VSS	—	4.5	5.0	5.5	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VEE – VSS	—	-21.5	-22.0	-22.5	V
INPUT VOLTAGE NOTE (1)	VIH	H LEVEL	0.5*VDD	—	—	V
	VIL	L LEVEL	—	—	0.2*VDD	V
OUTPUT VOLTAGE NOTE (1)	VOH	H LEVEL	2.4	—	—	V
	VOL	L LEVEL	—	—	VSS+0.4	V
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD – VSS = 5.0 V	—	22	40	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD – VO = 22.5V	—	6	8	mA
RECOMMENDED LCD DRIVING VOLTAGE	VDD – VO ∅ = 10° θ = ** DUTY =1/240	Ta = - 20 °C	22.7	23.7	24.7	V
		Ta = 25 °C	21.5	22.5	23.5	V
		Ta = 70 °C	19.7	20.7	21.7	V
CLOCK OSCILLATION FREQUENCY	f OSC	—	—	8	—	MHz
LED FORWAD VOLTAGE	VLED – VLSS	—	—	5.0	—	V
LED FORWAD VOLTAGE	IF	VLED–VLSS	—	140	—	mA

** θ = 0 ° WHEN VIEWING DIRECTION IS 6 O'CLOCK
θ = 90 ° WHEN VIEWING DIRECTION IS 3 O'CLOCK

NOTE (1): APPLIED TO TERMINALS D0 TO D7, A0, $\overline{CS}$, R / $\overline{W}$($\overline{WR}$), E($\overline{RD}$).

NOTE (2): THE DISPLAY PATTERN IS ALL " OFF " / " ON" .

5. OPTICAL CHARACTERISTICS

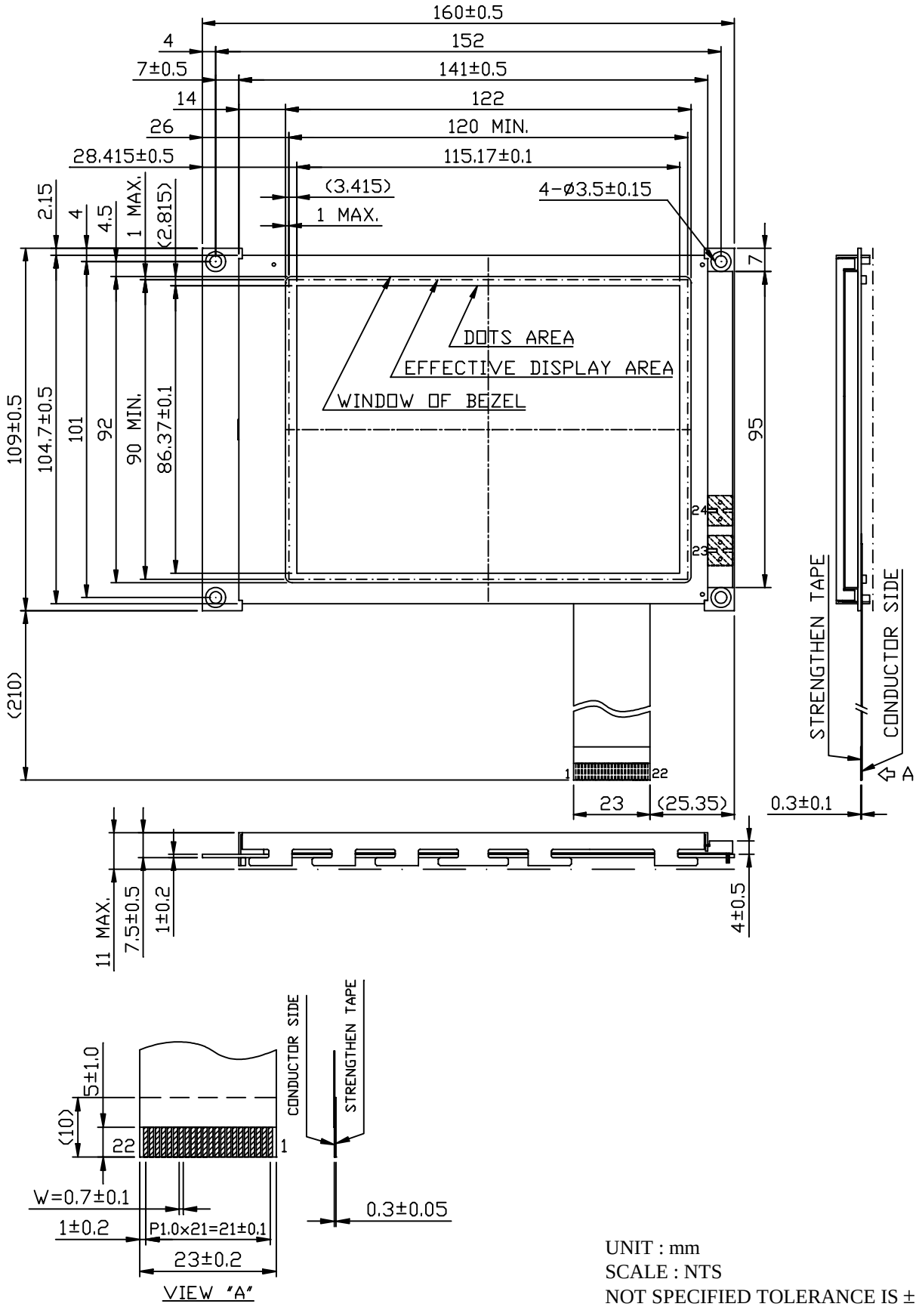
Ta = 25 °C VDD = 5.0 V VDD-V0 = (22.5V)

ITEM		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	STN	∅2 - ∅1	K ≧ 2.0		—	40	—	deg.	1
	FSTN				—	50	—	deg.	1
CONTRAST RATIO	STN	K	∅ = 10 °		—	10	—	—	1
	FSTN		θ = 0 °		—	20	—	—	1
RESPONSE TIME		tr (rise)	∅ =10° θ = **	Ta = -20 °C	—	3816	—	ms	1
				Ta = 25 °C	—	310	—		
				Ta = 70 °C	—	96	—		
		tf (fall)		Ta = -20 °C	—	2411	—		
				Ta = 25 °C	—	158	—		
				Ta = 70 °C	—	89	—		
BRIGHTNESS		B	VLED – VLSS = 5.0 V		9.8	12.8	—	cd / m^2	1, 2
					6.5	8.5	—		1, 3
CHROMATICITY COORDINATES		X	IF = 140 mA		0.26	0.315	0.33	—	—
		Y			0.29	0.305	0.32		

** θ = 0 ° WHEN VIEWING DIRECTION IS 6 O'CLOCK.
θ = 90 ° WHEN VIEWING DIRECTION IS 3 O'CLOCK.

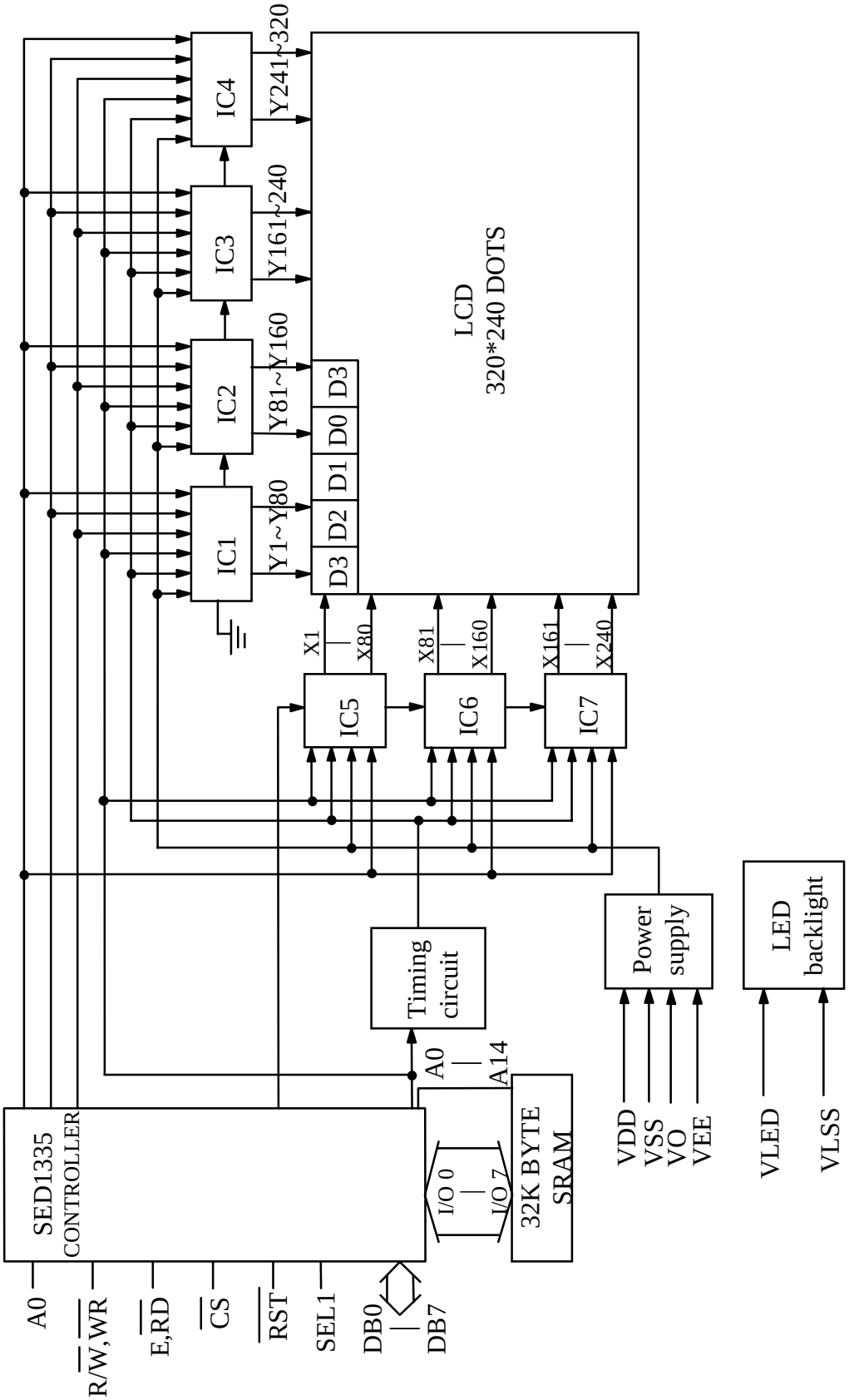
NOTE (1): PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU - 001A)
NOTE (2): POLARIZER MODE : TRANSMISSIVE
NOTE (3): POLARIZER MODE : TRANSFLECTIVE

6. OUTLINE DIMENSION

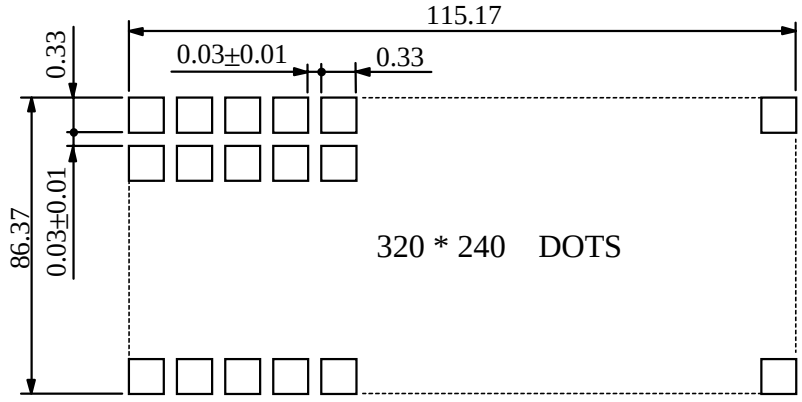


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.3

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



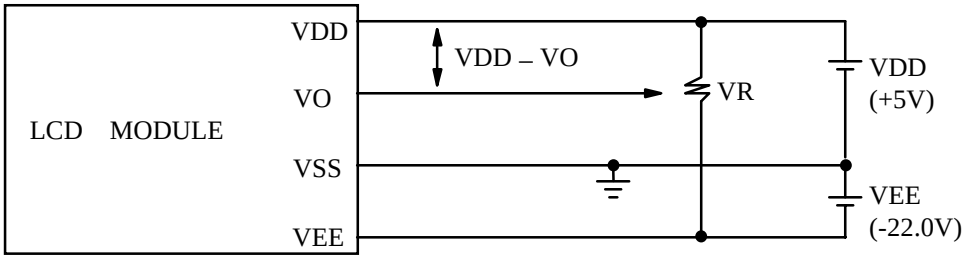
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.1

9. INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION
1	VSS	—	GROUND
2	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT
3	VO	—	OPERATING VOLTAGE FOR LCD DRIVING
4	A0	—	8080 FAMILY INTERFACE AO, $\overline{RD}$, $\overline{WR}$, FUNCTION 0, 0, 1, STATUS FLAG READ 1, 0, 1, DISPLAY DATA AND CURSOR ADDRESS READ 0, 1, 0, DISPLAY DATA AND PARAMETER WRITE 1, 1, 0, COMMAND WRITE 6800 FAMILY INTERFACE AO, R / $\overline{W}$, E, FUNCTION 0, 1, 1, STATUS FLAG READ 1, 1, 1, DISPLAY DATA AND CURSOR ADDRESS READ 0, 0, 1, DISPLAY DATA AND PARAMETER WRITE 1, 0, 1, COMMAND WRITE
5	$\overline{WR}$, R / $\overline{W}$	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW WRITE STROBE . 6800 FAMILY INTERFACE ACTS AS THE READ/ WRITE CONTROL SIGNAL .
6	$\overline{RD}$, E	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW READ STROBE . 6800 FAMILY INTERFACE ACTS AS THE ACTIVE-HIGH ENABLE CLOCK .
7 ≀ 14	D0 ≀ D7	H/L	DISPLAY DATA
15	$\overline{CS}$	H/L	CHIP SELECT
16	$\overline{RST}$	H/L	RESET
17	VEE	—	POWER SUPPLY FOR LCD DRIVING
18	SEL1	H/L	8080 OR 6800 FAMILY INTERFACE SELECT , H:6800 , L:8080
19 | 20	NC	—	NOT USE
21,23	VLED	—	POWER SUPPLY FOR LED BACKLIGHT (A)
22,24	VLSS	—	POWER SUPPLY FOR LED BACKLIGHT (K)

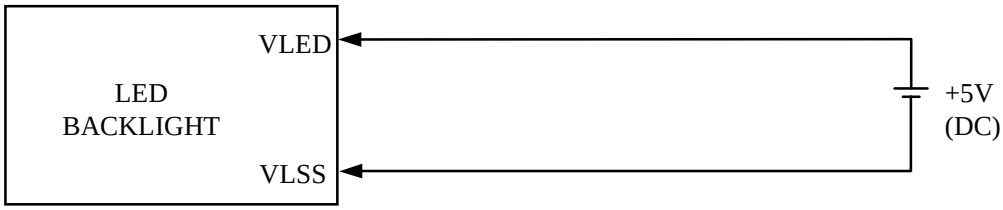
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM



VDD – VO : LCD DRIVING VOLTAGE
VR : 20KΩ

10.2 POWER SUPPLY FOR LED BACK - LIGHT



10.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL