

EXAMINED BY :	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-10546
<i>Bob Hu</i>		ISSUE : MAR.29,2006
APPROVED BY:		TOTAL PAGE : 8
<i>David Chang</i>		VERSION : 1

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
----------	------------	----------------

MODEL NO . :

32FD0(LED TYPES)

(RoHS)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

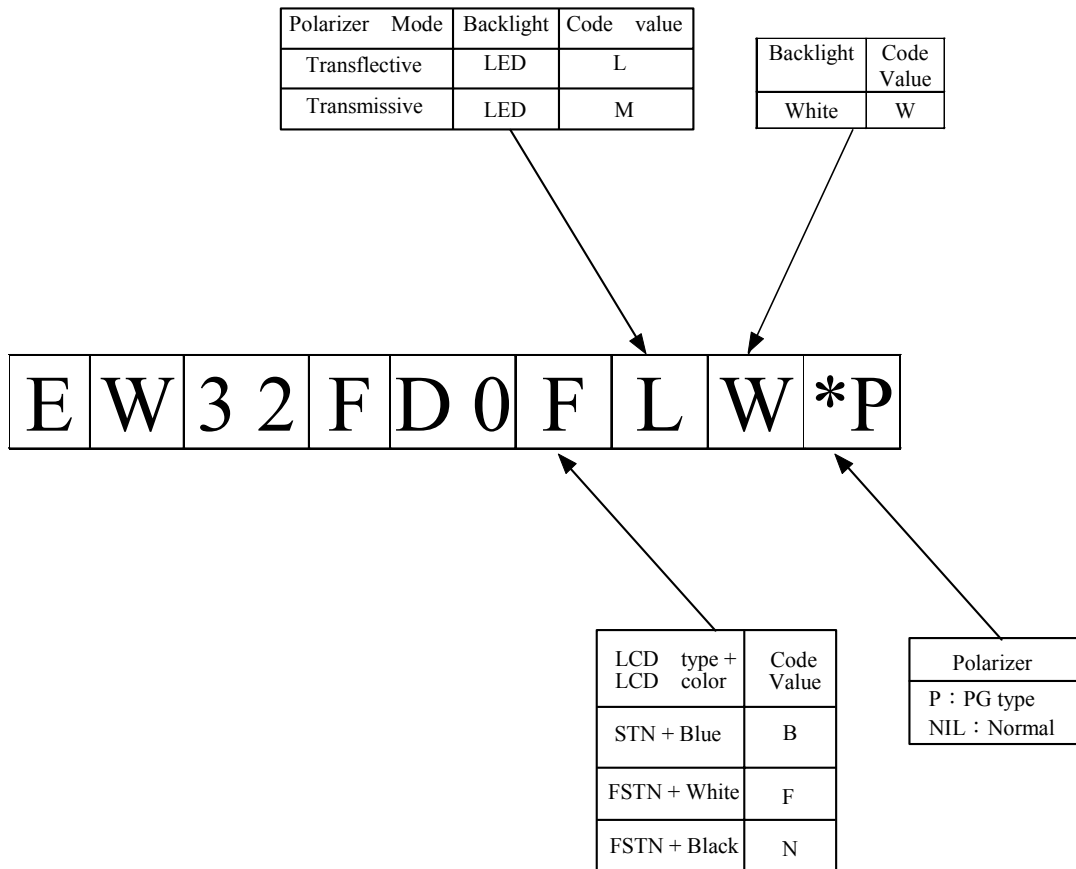
EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO . 32FD0(LED TYPES)(RoHS)	VERSION 1	PAGE 0-1
--------------------------------------	--------------	-------------

RECORDS OF REVISION	DOC . FIRST ISSUE MAR.29,2006
---------------------	----------------------------------

DATE	REVISED PAGE NO.	SUMMARY

NUMBERING SYSTEM



*P : PG TYPE ONLY FOR EW32FD0FLWP

TABLE OF CONTENTS

NO.	ITEM	PAGE
1.	GENERAL SPECIFICATIONS -----	1
2.	MECHANICAL SPECIFICATIONS -----	1
3.	ABSOLUTE MAXIMUM RATINGS -----	2
4.	ELECTRICAL CHARACTERISTICS -----	3
5.	OPTICAL CHARACTERISTICS -----	4
6.	OUTLINE DIMENSIONS -----	5
7.	BLOCK DIAGRAM -----	6
8.	DETAIL DRAWING OF DOT MATRIX -----	7
9.	INTERFACE SIGNALS -----	7
10.	POWER SUPPLY -----	8

1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 2 B

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER :

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - S E D 1 3 3 5

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

1.4 MATERIAL SAFETY DESCRIPTION

ASSEMBLIES SHALL COMPLY WITH EUROPEAN ROHS REQUIREMENTS, INCLUDING PROHIBITED MATERIALS/COMPONENTS CONTAINING LEAD, MERCURY, CADMIUM, HEXAVALENT CHROMIUM, POLYBROMINATED BIPHENYLS (PBB) AND POLYBROMINATED DIPHENYL ETHERS (PBDE)

2. MECHANICAL SPECIFICATIONS

- | | | |
|------------------------|-------|--|
| (1) NUMBER OF DOTS | ----- | 320W * 240H DOTS |
| (2) MODULE SIZE | ----- | 96.8W * 85.0H * 8.5D mm
(NOT INCLUDED FFC LENGTH) |
| (3) EFFECTIVE AREA | ----- | 77.8W * 58.6H mm |
| (4) ACTIVE AREA | ----- | 76.79W * 57.59H mm |
| (5) DOT SIZE | ----- | 0.23W * 0.23H mm |
| (6) DOT PITCH | ----- | 0.24W * 0.24H mm |
| (7) LCD TYPE * | | |
| (8) DRIVING METHOD | ----- | 1 / 240 DUTY MULTIPLEX DRIVE |
| (9) BACKLIGHT | ----- | LED , COLOR : WHITE |
| (10) VIEWING DIRECTION | ----- | 6 O'CLOCK |

* 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	VLCD – VSS	0	27	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR LED	VLED – VLSS	—	5	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 .

I T E M	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	- 20°C	70°C	- 30°C	80°C	NOTE (1) ,(3)
HUMIDITY	NOTE (2)		NOTE (2)		WITHOUT CONDENSATION
VIBRATION	—	2.45m /s ² (0.25G)	—	11.76m /s ² (1.2G)	10~100 Hz XYZ DIRECTIONS 1 Hr . EACH
SHOCK	—	29.4m /s ² (3G)	—	490.0m /s ² (50G)	10 mSECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (1) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT
TEMPERATURE THIS PHENOMENON IS REVERSIBLE .

NOTE (2) : Ta ≤ 60°C : 85%RH MAX.(96hrs MAX.)

Ta > 60°C : ABSOLUTE HUMIDITY MUST BE

LOWER THAN THE HUMIDITY OF 85%RH AT 60°C.(96hrs MAX.)

NOTE (3) : Ta AT -30°C : WILL BE <48hrs

80°C : WILL BE < 168hrs

4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD - VSS	—	3.3	—	5.5	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VLCD - VSS	—	+15	—	+27	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 =5.0V	—	16.0	23.0	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	ILCD	VLCD-VSS =21.7V	—	6.0	9.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	VLCD - VSS $\theta_y=10^\circ, \theta_x=0^\circ$ DUTY =1/240	Ta =-20°C NOTE (4)	21.5	22.5	23.5	V
		Ta =25°C NOTE (3)	20.7	21.7	22.7	V
		Ta =70°C NOTE (3)	19.9	20.9	21.9	V
CLOCK OSCILLATION FREQUENCY	f OSC	—	—	8	—	MHz
POWER SUPPLY FOR LED	VLED - VLSS	IF = 100 mA	—	5	—	V

NOTE (1): APPLIED TO TERMINALS D0 TO D7, A0, R/W(WR), E(RD), CS, RST, SEL1

NOTE (2): THIS DISPLAY PATTERN IS ALL “OFF” / “ON” .

NOTE (3): THIS DISPLAY PATTERN IS ALL Q.

NOTE (4): THIS DISPLAY PATTERN IS ALL “BAR” (ONLY Ta=-20°C)

5. OPTICAL CHARACTERISTICS

Ta = 25 °C

I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE		θ_{y+}	$\theta_{x=0^{\circ}}$	45	50	—	deg.	1
		θ_{y-}		45	50	—		
		θ_{x+}	$\theta_{y=0^{\circ}}$	40	45	—	deg.	1
		θ_{x-}		30	35	—		
CONTRAST RATIO	STN	K	$\theta_{y-}=10^{\circ}, \theta_{x=0^{\circ}}$	1.5	3.0	—	—	1
	FSTN			1.5	3.1	—	—	1
				1.5	5.9	—	—	1, 4
RESPONSE TIME	t r (rise)	$\theta_{y-}=10^{\circ}$ $\theta_{x=0^{\circ}}$	Ta=-20°C	—	4500	5850	msec	1
			Ta=25°C	—	300	390		
			Ta=70°C	—	70	91		
	t f (fall)		Ta=-20°C	—	3000	3900	msec	1
			Ta=25°C	—	190	247		
			Ta=70°C	—	90	117		
THE BRIGHTNESS OF MODULE	L	VLED-VLSS=5.0V	8	10	—	cd/m ²	2	
			12	15	—		3	
			6.4	8.0	—		4	
THE UNIFORMITY OF MODULE	—			—	—	30	%	2, 3, 4

K* =STN : K≥1.5 ,FSTN : K≥2.0

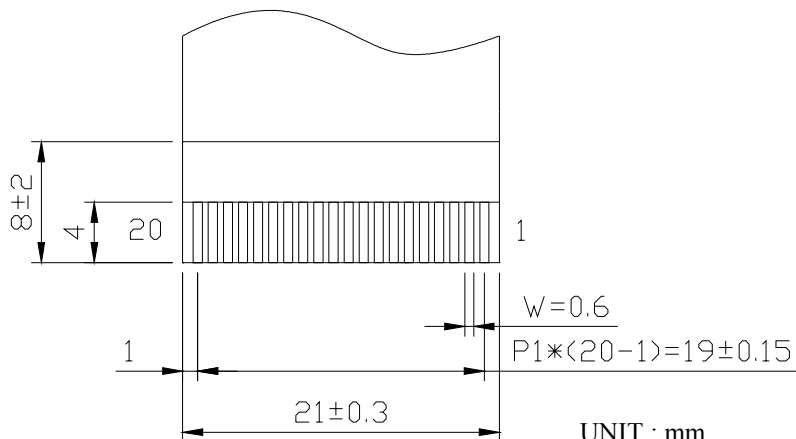
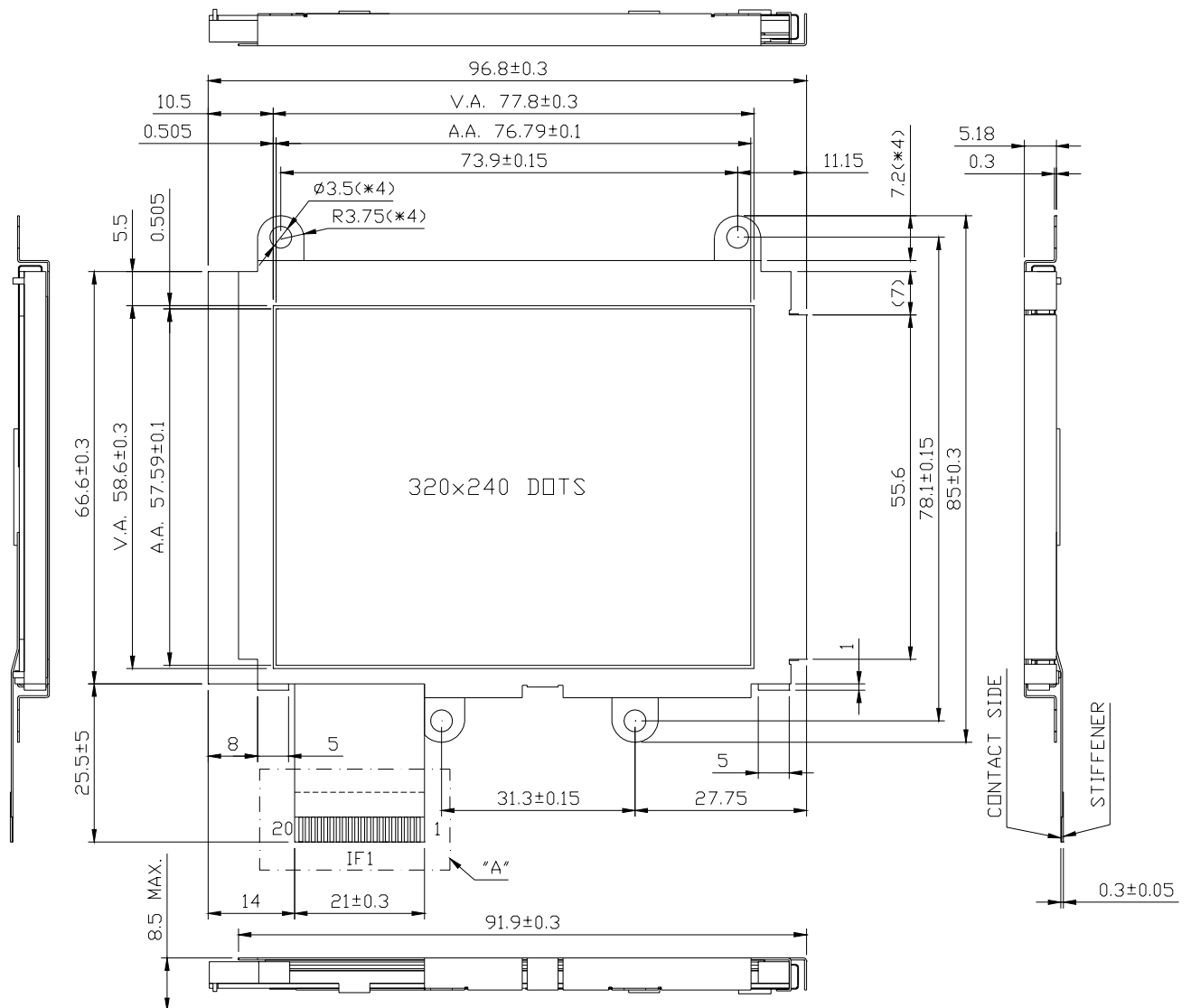
NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU-002B)

NOTE (2) : POLARIZER IS TRANSFLECTIVE TYPE .

NOTE (3) : POLARIZER IS TRANSMISSIVE TYPE .

NOTE (4) : POLARIZER IS PG TYPE.

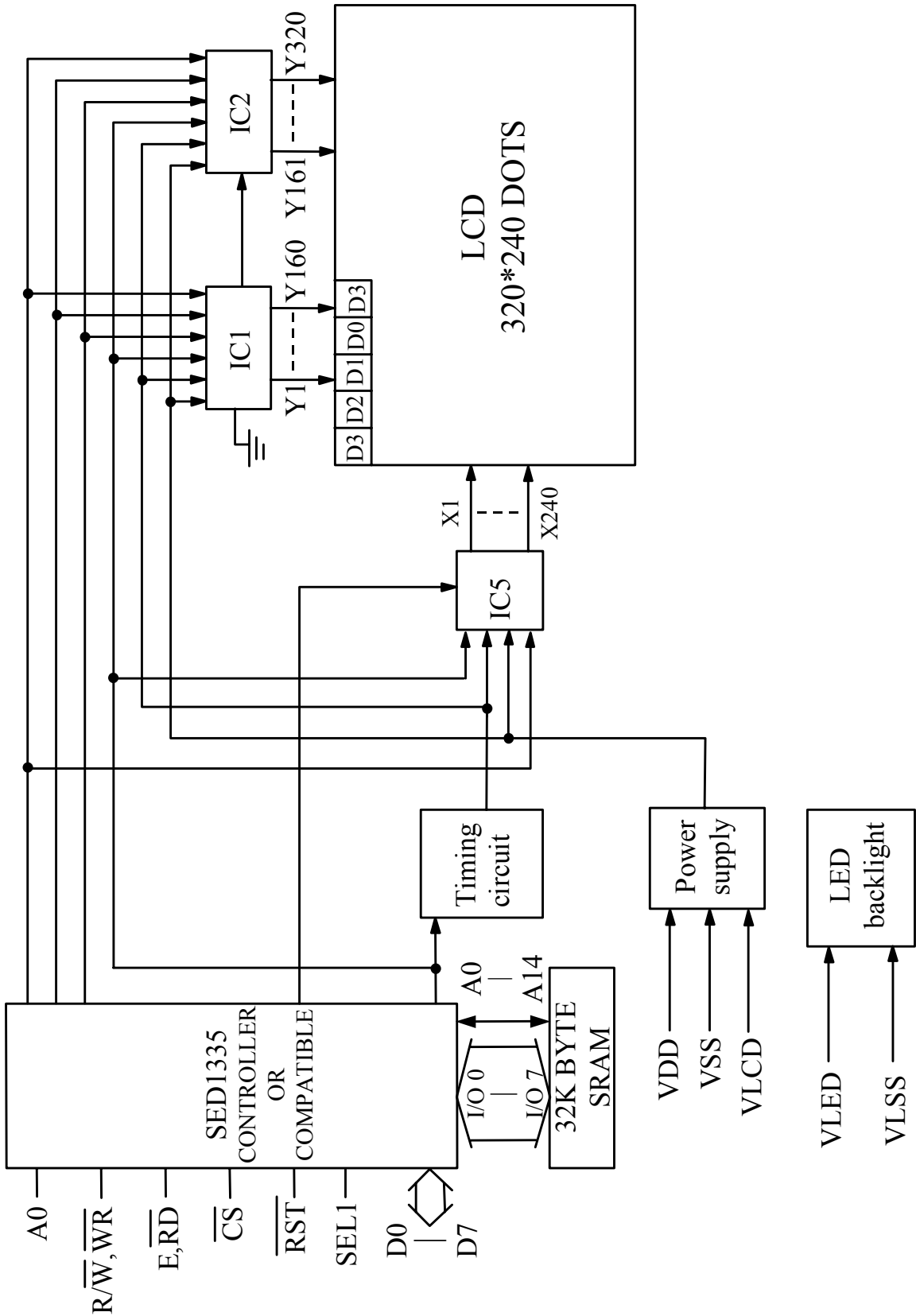
6. OUTLINE DIMENSIONS



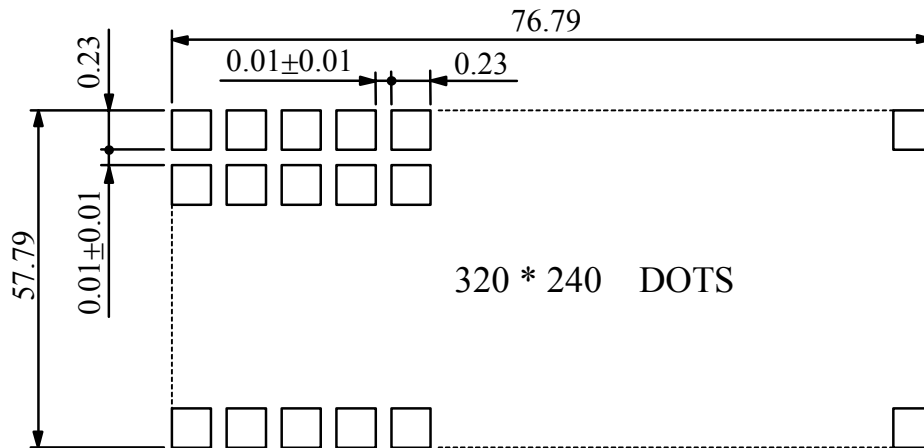
DETAIL "A"

UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



320 * 240 DOTS

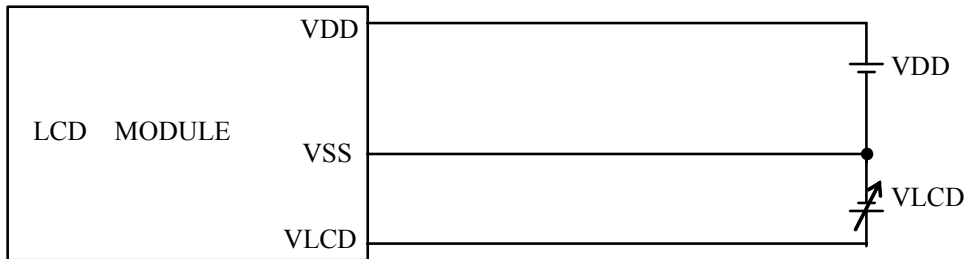
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.1

9. INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION																				
1	VSS	—	GROUND																				
2	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT																				
3	N.C	—	N.C.																				
4	A0	—	8080 FAMILY INTERFACE																				
			<table border="1"> <thead> <tr> <th>AO</th> <th>RD</th> <th>WR</th> <th>FUNCTION</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> <td>STATUS FLAG READ</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>DISPLAY DATA AND CURSOR ADDRESS READ</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>DISPLAY DATA AND PARAMETER WRITE</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>COMMAND WRITE</td> </tr> </tbody> </table>	AO	RD	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
			AO	RD	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																				
			<table border="1"> <thead> <tr> <th>AO</th> <th>R/W</th> <th>E</th> <th>FUNCTION</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>1</td> <td>STATUS FLAG READ</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>DISPLAY DATA AND CURSOR ADDRESS READ</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>DISPLAY DATA AND PARAMETER WRITE</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>COMMAND WRITE</td> </tr> </tbody> </table>	AO	R/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
			AO	R/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																				
8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW WRITE STROBE .																							
6800 FAMILY INTERFACE ACTS AS THE READ/ WRITE CONTROL SIGNAL .																							
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	CS	H/L	CHIP SELECT																				
16	RST	H/L	RESET																				
17	VLCD	—	POWER SUPPLY FOR LCD DRIVING																				
18	SEL1	H/L	8080 OR 6800 FAMILY INTERFACE SELECT , H:6800 , L:8080																				
19	VLED	—	POWER SUPPLY FOR LED B.L																				
20	VLSS	—	POWER SUPPLY FOR LED B.L																				

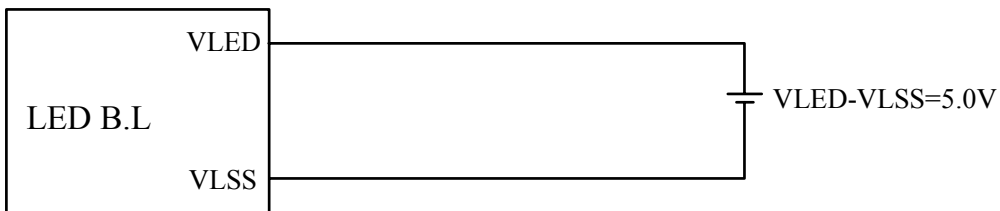
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM



VLCD – VSS : LCD DRIVING VOLTAGE

10.2 POWER SUPPLY FOR LED BACK - LIGHT



10.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

