

EXAMINED BY : <i>Bob Hu</i>	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-51567
APPROVED BY: <i>David Chang</i>		ISSUE : APR.04, 2007
		TOTAL PAGE : 8
		VERSION : 2

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :

E W 5 0 8 5 5 B M W

(RoHS)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

RECORDS OF REVISION	DOC . FIRST ISSUE	MAR.14, 2007
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DATE	REVISED PAGE NO.	SUMMARY																																																																																																																																				
APR.04, 2007	4	<p>5. OPTICAL CHARACTERISTICS</p> <table border="1"> <thead> <tr> <th>ITEM</th> <th>SYMBOL</th> <th>CONDITION</th> <th>MIN.</th> <th>TYP.</th> <th>MAX.</th> <th>UNIT</th> <th>NOTE</th> </tr> </thead> <tbody> <tr> <td rowspan="4">VIEWING ANGLE</td> <td>θ_{y+}</td> <td rowspan="4">$K \geq 1.5$</td> <td rowspan="4">$\theta_x = 0^\circ$</td> <td>(26)</td> <td>(31)</td> <td>—</td> <td rowspan="4">deg. 1</td> </tr> <tr> <td>θ_{y-}</td> <td>(29)</td> <td>(34)</td> <td>—</td> </tr> <tr> <td>θ_{x+}</td> <td>(19)</td> <td>(24)</td> <td>—</td> </tr> <tr> <td>θ_{x-}</td> <td>(32)</td> <td>(37)</td> <td>—</td> </tr> <tr> <td rowspan="2">CONTRAST RATIO</td> <td>STN</td> <td rowspan="2">K</td> <td rowspan="2">$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$</td> <td>3</td> <td>5</td> <td>—</td> <td rowspan="2">— 1</td> </tr> <tr> <td>FSTN</td> <td>4</td> <td>6</td> <td>—</td> <td>— 1</td> </tr> <tr> <td rowspan="6">RESPONSE TIME</td> <td rowspan="2">tr (rise)</td> <td rowspan="6">$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$</td> <td>$T_a = 20^\circ\text{C}$</td> <td>—</td> <td>9580</td> <td>12454</td> <td rowspan="6">ms 1</td> </tr> <tr> <td>$T_a = 25^\circ\text{C}$</td> <td>—</td> <td>280</td> <td>364</td> </tr> <tr> <td>$T_a = 70^\circ\text{C}$</td> <td>—</td> <td>105</td> <td>137</td> </tr> <tr> <td>$T_a = 20^\circ\text{C}$</td> <td>—</td> <td>5410</td> <td>7033</td> </tr> <tr> <td>$T_a = 25^\circ\text{C}$</td> <td>—</td> <td>190</td> <td>247</td> </tr> <tr> <td>$T_a = 70^\circ\text{C}$</td> <td>—</td> <td>80</td> <td>104</td> </tr> <tr> <td rowspan="2">tf (fall)</td> <td rowspan="2">↓</td> <td>$T_a = 20^\circ\text{C}$</td> <td>—</td> <td>27</td> <td>34</td> <td rowspan="2">—</td> </tr> <tr> <td>$T_a = 25^\circ\text{C}$</td> <td>—</td> <td>24</td> <td>31</td> </tr> <tr> <td rowspan="4">VIEWING ANGLE</td> <td rowspan="4">$K \geq 1.5$</td> <td rowspan="4">$\theta_x = 0^\circ$</td> <td rowspan="4">$\theta_{y+} = 10^\circ$</td> <td>30</td> <td>37</td> <td>—</td> <td rowspan="4">deg. 1</td> </tr> <tr> <td>$\theta_{y-} = 0^\circ$</td> <td>17</td> <td>24</td> <td>—</td> </tr> <tr> <td rowspan="2">CONTRAST RATIO</td> <td rowspan="2">STN</td> <td rowspan="2">K</td> <td rowspan="2">$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$</td> <td>2.3</td> <td>3.8</td> <td>—</td> <td rowspan="2">— 1</td> </tr> <tr> <td>FSTN</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td rowspan="6">RESPONSE TIME</td> <td rowspan="2">tr (rise)</td> <td rowspan="6">$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$</td> <td>$T_a = 20^\circ\text{C}$</td> <td>—</td> <td>7950</td> <td>10340</td> <td rowspan="6">ms 1</td> </tr> <tr> <td>$T_a = 25^\circ\text{C}$</td> <td>—</td> <td>220</td> <td>290</td> </tr> <tr> <td>$T_a = 70^\circ\text{C}$</td> <td>—</td> <td>90</td> <td>120</td> </tr> <tr> <td>$T_a = 20^\circ\text{C}$</td> <td>—</td> <td>5500</td> <td>7150</td> </tr> <tr> <td>$T_a = 25^\circ\text{C}$</td> <td>—</td> <td>210</td> <td>270</td> </tr> <tr> <td>$T_a = 70^\circ\text{C}$</td> <td>—</td> <td>75</td> <td>100</td> </tr> </tbody> </table>	ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE	VIEWING ANGLE	θ_{y+}	$K \geq 1.5$	$\theta_x = 0^\circ$	(26)	(31)	—	deg. 1	θ_{y-}	(29)	(34)	—	θ_{x+}	(19)	(24)	—	θ_{x-}	(32)	(37)	—	CONTRAST RATIO	STN	K	$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$	3	5	—	— 1	FSTN	4	6	—	— 1	RESPONSE TIME	tr (rise)	$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$	$T_a = 20^\circ\text{C}$	—	9580	12454	ms 1	$T_a = 25^\circ\text{C}$	—	280	364	$T_a = 70^\circ\text{C}$	—	105	137	$T_a = 20^\circ\text{C}$	—	5410	7033	$T_a = 25^\circ\text{C}$	—	190	247	$T_a = 70^\circ\text{C}$	—	80	104	tf (fall)	↓	$T_a = 20^\circ\text{C}$	—	27	34	—	$T_a = 25^\circ\text{C}$	—	24	31	VIEWING ANGLE	$K \geq 1.5$	$\theta_x = 0^\circ$	$\theta_{y+} = 10^\circ$	30	37	—	deg. 1	$\theta_{y-} = 0^\circ$	17	24	—	CONTRAST RATIO	STN	K	$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$	2.3	3.8	—	— 1	FSTN	—	—	—	RESPONSE TIME	tr (rise)	$\theta_{y+} = 10^\circ$ $\theta_{x+} = 0^\circ$	$T_a = 20^\circ\text{C}$	—	7950	10340	ms 1	$T_a = 25^\circ\text{C}$	—	220	290	$T_a = 70^\circ\text{C}$	—	90	120	$T_a = 20^\circ\text{C}$	—	5500	7150	$T_a = 25^\circ\text{C}$	—	210	270	$T_a = 70^\circ\text{C}$	—	75	100
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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 2 B

1.2 APPLICATION NOTE FOR CONTROLLER/DRIVER

PLEASE REFER TO:

CUSTOMER ACCEPTANCE STANDAR SPECIFICATIONS:

A M T 3 3 5 A

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 | ----- | 139.0W * 102.5H * 13.2D mm |
| (3) EFFECTIVE AREA | ----- | 103.0W * 79.0H mm |
| (4) ACTIVE AREA | ----- | 95.98W * 71.98H mm |
| (5) DOT SIZE | ----- | 0.28W * 0.28H mm |
| (6) DOT PITCH | ----- | 0.30W * 0.30 mm |
| (7) LCD TYPE | ----- | STN , BLUE , TRANSMISSIVE |
| (8) DRIVING METHOD | ----- | 1 / 240 DUTY MULTIPLEX DRIVE |
| (9) VIEWING DIRECTION | ----- | 6 O'CLOCK |
| (10) BACKLIGHT | ----- | LED , COLOR : WHITE |

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS .

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	0	6.0	V	
POWER SUPPLY FOR LCD DRIVING	VDD – VEE	0	30.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)

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 m SECONDS 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 : 90%RH MAX.(96hrs MAX.)

Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE
HUMIDITY OF 90%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		VDD=5.0V		
PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD – VSS	—	4.75	5.0	5.25	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 VDD – VO = 23.5 V	—	25.0	37.5	mA
RECOMMENDED LCD DRIVING VOLTAGE	VDD – VO θy=-10°, θx= 0 ° DUTY =1/240	Ta = -20 °C	25.6	26.6	27.6	V
		Ta = 25 °C	22.5	23.5	24.5	V
		Ta = 70 °C	17.4	18.4	19.4	V
CLOCK OSCILLATION FREQUENCY	fOSC	—	—	8	—	MHz
LED FORWARD VOLTAGE	VLED – VLSS	—	—	5.0	—	V
LED FORWARD CURRENT	IF	VLED-VLSS=5.0V	—	160	—	mA

NOTE (1): APPLIED TO TERMINALS DO TO D7, AO, \overline{CS} , R/ \overline{W} (\overline{WR}), E(\overline{RD}), \overline{RST} , SEL1 .

NOTE (2): THE DISPLAY PATTERN IS ALL “ON” OR “OFF”.

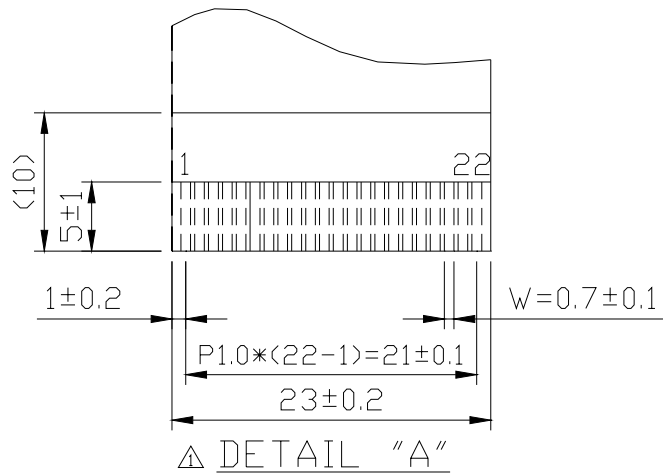
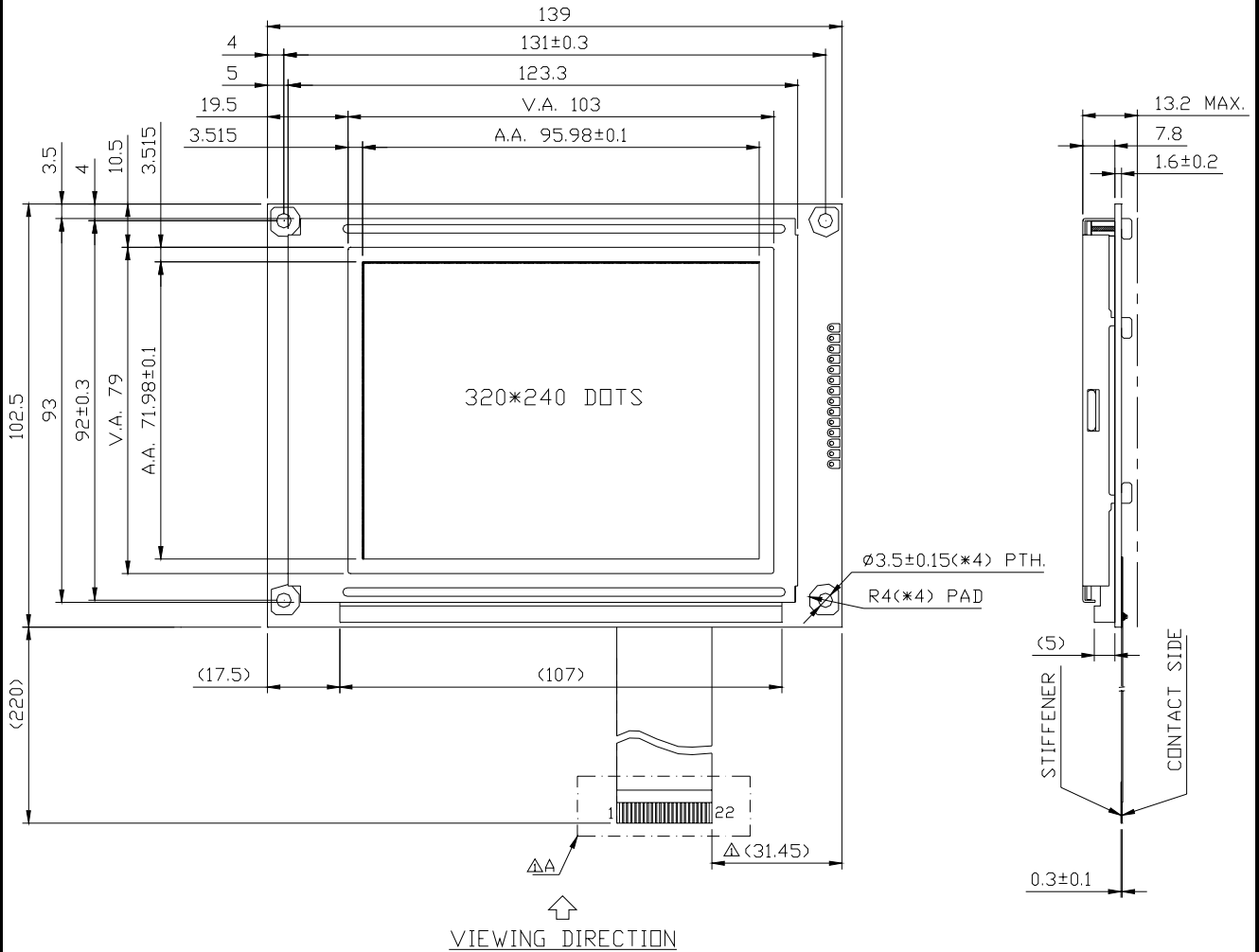
5. OPTICAL CHARACTERISTICS

Ta = 25 °C VDD = 5.0 V

I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE	
VIEWING ANGLE		θ_{y+}	$K \geq 1.5$	$\theta_x = 0^\circ$	27	34	—	deg.	1
		θ_{y-}			24	31	—		
		θ_{x+}		$\theta_y = 0^\circ$	30	37	—		
		θ_{x-}			17	24	—		
CONTRAST RATIO	STN	K	$\theta_{y-} = 10^\circ$ $\theta_x = 0^\circ$	2.3	3.8	—	—	1	
RESPONSE TIME	tr (rise)	$\theta_{y-} = 10^\circ$ $\theta_x = 0^\circ$	Ta = -20°C	—	7950	10340	ms	1	
			Ta = 25°C	—	220	290			
			Ta = 70°C	—	90	120			
	tf (fall)		Ta = -20°C	—	5500	7150			
			Ta = 25°C	—	210	270			
			Ta = 70°C	—	75	100			
BRIGHTNESS OF MODULE		L	VLED - VLSS = 5.0 V	24	30	—	cd/m ²	2	
CHROMATICITY COORDINATES		x	IF = 160 mA	0.287	0.325	0.360	—	—	
		y		0.290	0.325	0.360			

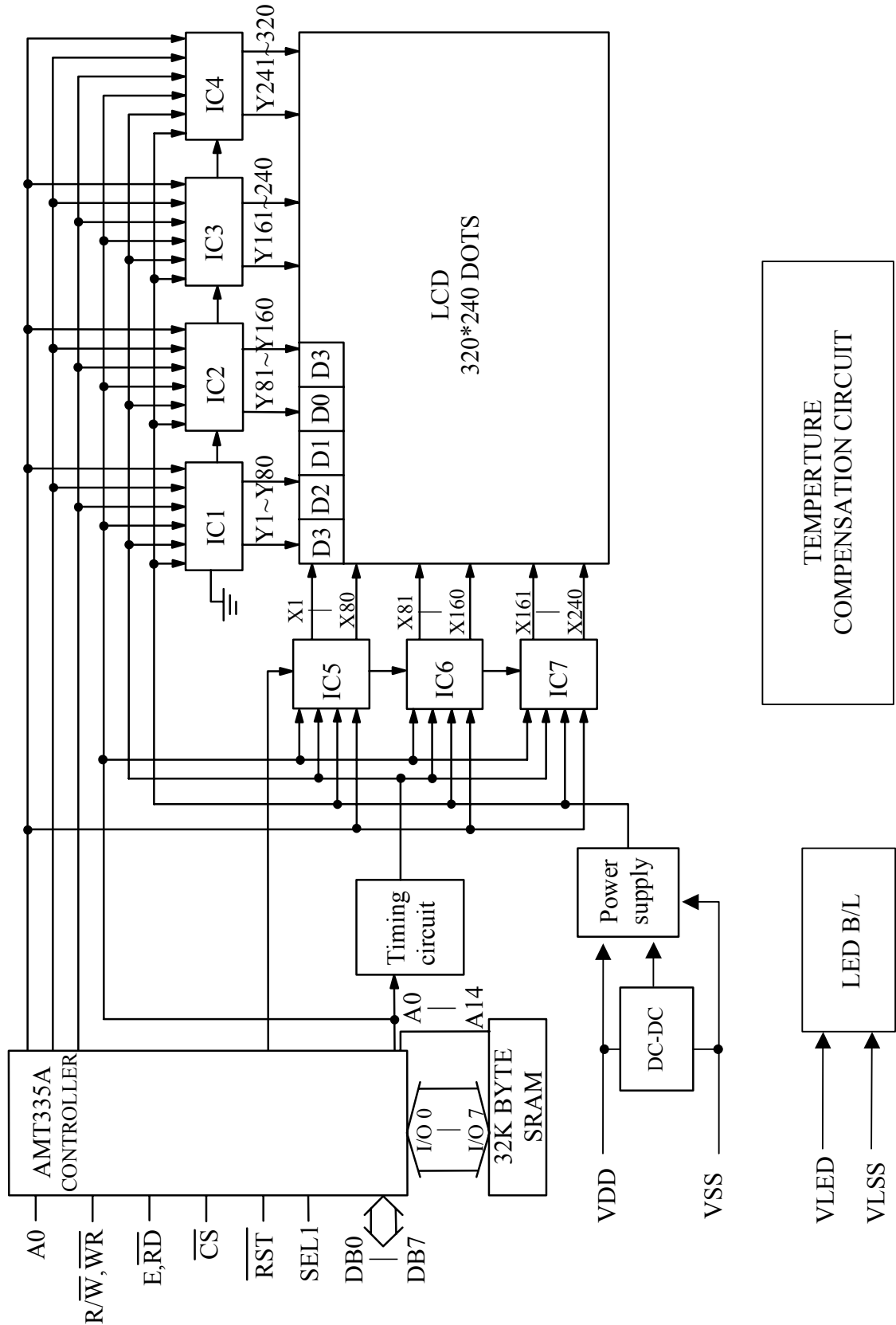
NOTE (1) : PLEASE REFER TO :
 CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU - 002B)
NOTE (2) : POLARIZER MODE : TRANSMISSIVE

6. OUTLINE DIMENSIONS

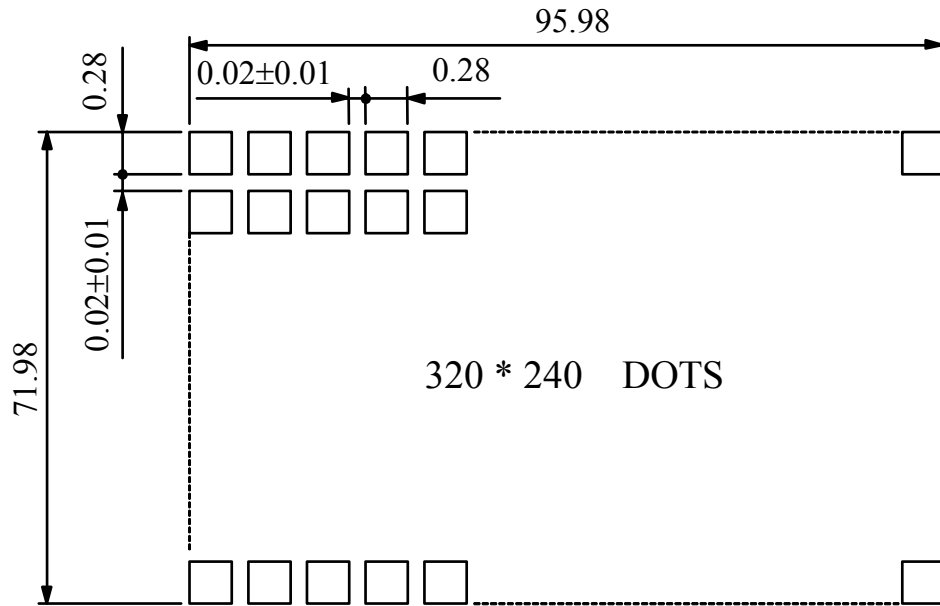


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5
NOTE : MARK Δ MODIFY (NUMBER NOTE MODIFY VERSION)

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



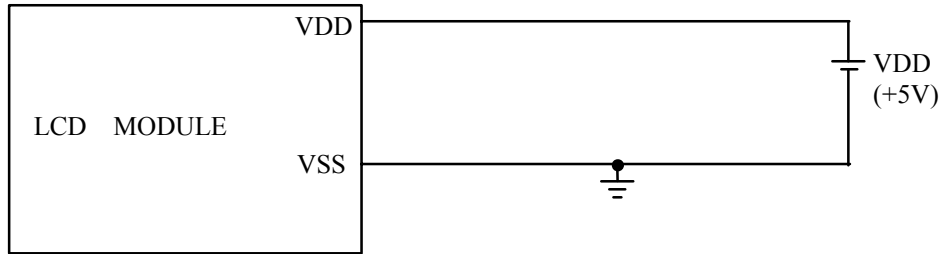
UNIT: mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.1

9. INTERFACE SIGNALS

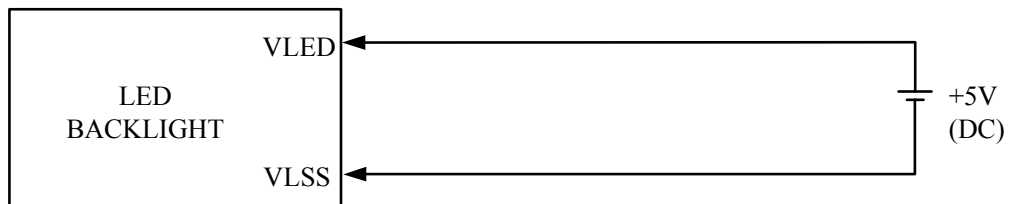
PIN NO.	SYMBOL	LEVEL	FUNCTION																				
1	VSS	—	GROUND																				
2	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT																				
3	NC	—	NOT USE.																				
4	A0	—	8080 FAMILY INTERFACE																				
			<table border="1"> <thead> <tr> <th>AO</th> <th>\overline{RD}</th> <th>\overline{WR}</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	\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
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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	NC	—	NOT USE.																				
18	SEL1	H/L	8080 OR 6800 FAMILY INTERFACE SELECT , H:6800 , L:8080																				
19 20	NC	—	NOT USE																				
21	VLED	—	POWER SUPPLY FOR LED BACKLIGHT (A)																				
22	VLSS	—	POWER SUPPLY FOR LED BACKLIGHT (K)																				

10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM



10.2 POWER SUPPLY FOR LED BACK - LIGHT



10.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

