

EXAMINED BY :  <i>Bob Hu</i>	EMERGING DISPLAY  TECHNOLOGIES CORPORATION	FILE NO . CAS-51426
APPROVED BY:  <i>David Chang</i>		ISSUE : JUN.19, 2006
		TOTAL PAGE : 10
		VERSION : 1

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

MODEL NO. :  
  
EW50397NCW  
  
(RoHS)  
FOR MESSRS :  
  
\_\_\_\_\_

CUSTOMER'S APPROVAL

DATE :  
\_\_\_\_\_

BY :  
\_\_\_\_\_

EMERGING DISPLAY  
TECHNOLOGIES CORPORATION

MODEL NO .	VERSION	PAGE
EW50397NCW(RoHS)	1	0-1

RECORDS OF REVISION	DOC . FIRST ISSUE	JUN.19, 2006
---------------------	-------------------	--------------

DATE	REVISED PAGE NO.	SUMMARY

TABLE OF CONTENTS

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

1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

EU - 002B

1.2 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

1.3 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       | ----- | 154.3W * 96H * 14.6D(max) 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          | ----- | FSTN , NEGATIVE , BLACK ,<br>TRANSMISSIVE |
| (8)  | DRIVING METHOD    | ----- | 1 / 240 DUTY MULTIPLEX DRIVE              |
| (9)  | VIEWING DIRECTION | ----- | 6 O'CLOCK                                 |
| (10) | BACKLIGHT         | ----- | CCFL                                      |

### 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	28.0	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	- 10°C	60°C	- 20°C	70°C	NOTE (1),(3),(4)
HUMIDITY	NOTE (2)		NOTE (2)		WITHOUT CONDENSATION
VIBRATION	—	2.45m /s <sup>2</sup> ( 0.25G )	—	11.76m /s <sup>2</sup> ( 1.2G )	10~100 Hz XYZ DIRECTIONS 1 Hr . EACH
SHOCK	—	29.4m /s <sup>2</sup> ( 3G )	—	490.0m /s <sup>2</sup> ( 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: 90%RH MAX.(96hr MAX.)

Ta > 60°C: ABSOLUTE HUMIDITY MUST BE

LOWER THAN THE HUMIDITY OF 90%RH AT 60°C.(96hr MAX.)

NOTE (3) : Ta AT -20°C : WILL BE < 48hr

70°C : WILL BE < 168hr

NOTE (4) : CCFL BACKLIGHT IS NOT AVAILABLE TO FUNCTION BELOW 0°C.

4. ELECTRICAL CHARACTERISTICS

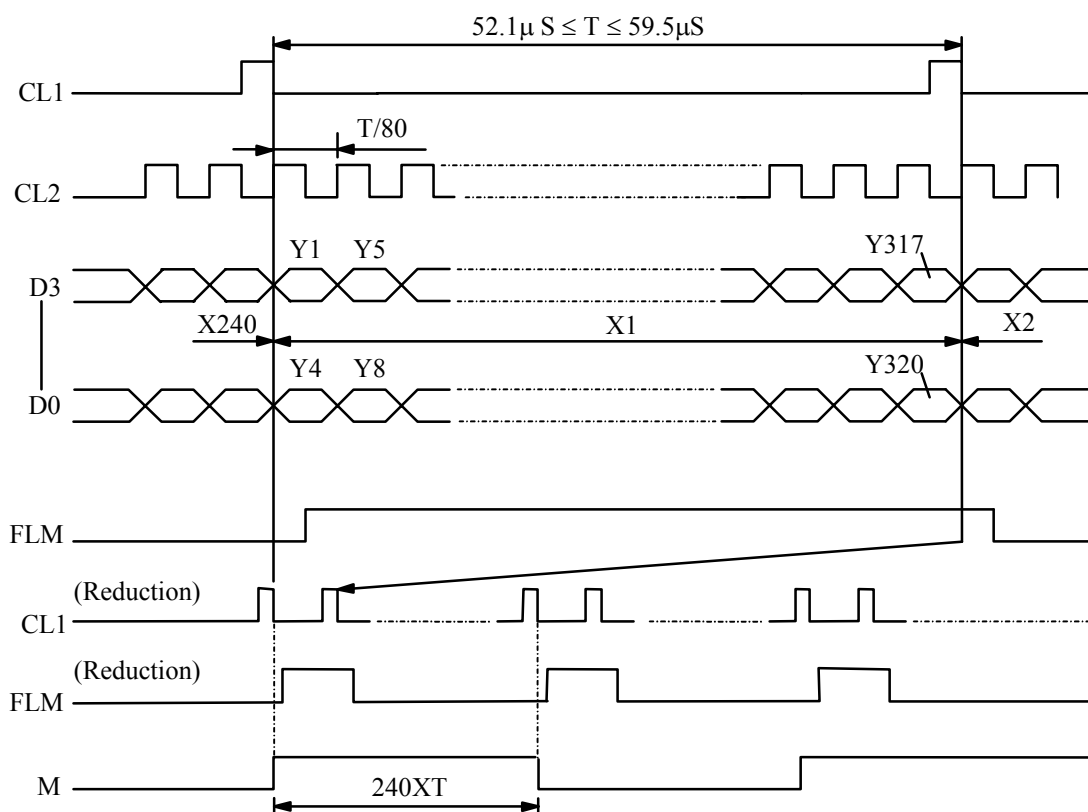
Ta = 25 °C VDD = 5.0 V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
POWER SUPPLY VOLTAGE FOR LOGIC	VDD - VSS	—	4.75	5.0	5.25	V	
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VEE - VSS	—	-21.5	-22.0	-22.5	V	
INPUT VOLTAGE NOTE (1)	VIH	H LEVEL	0.8*VDD	—	—	V	
	VIL	L LEVEL	—	—	0.2*VDD	V	
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD-VSS = 5.0 V VDD-VO = 21.6 V	—	4.0	7.0	mA	
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD-VSS = 5.0 V VDD-VO = 21.6 V	—	3.0	5.0	mA	
RECOMMENDED LCD DRIVING VOLTAGE	VDD-VO θy = 10° θx = 0° DUTY = 1/240	Ta = -10°C	23.6	24.6	25.6	V	
		Ta = 25 °C	20.6	21.6	22.6		
		Ta = 60 °C	15.6	16.6	17.6		
FLM FREQUENCY	f FLM	—	70	75	80	Hz	
POWER SUPPLY FOR CCFL	VOLTAGE	VCCFL	—	—	300	—	Vrms
	FREQUENCY	f CCFL	—	—	35K	—	Hz
	CURRENT	IL	—	—	5	—	mA
	LIFE TIME	L	IL = 5.0mA	45000	50000	—	Hrs

NOTE (1): APPLIED TO TERMINALS M, FLM, CL1, CL2, D0~D3, DISPOFF.

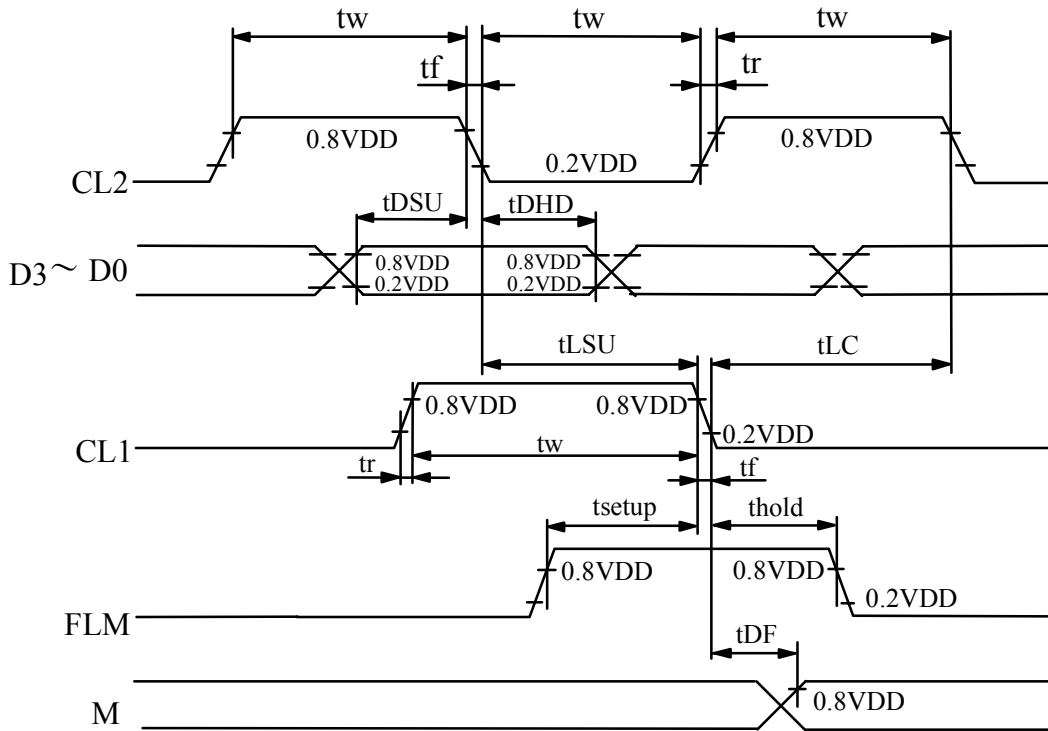
NOTE (2): THE DISPLAY PATTERN IS ALL "ON" / "OFF".

5. TIMING CHARACTERISTICS  
5.1 INTERFACE TIMING



5.2 SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Frequency of maximum clock	fcp	—	—	8	MHz
CL1 , CL2 , pulse width	tw	45	—	—	ns
Rise , fall time	tr,tf	—	—	15	ns
Data setup time	tDSU	20	—	—	ns
Data hold time	tDHD	20	—	—	ns
CL1 setup time	tLSU	80	—	—	ns
CL1 → CL2 time	tLC	80	—	—	ns
FLM setup time	tsetup	100	—	—	ns
FLM hold time	thold	100	—	—	ns
M delay time	tDF	—	—	300	ns





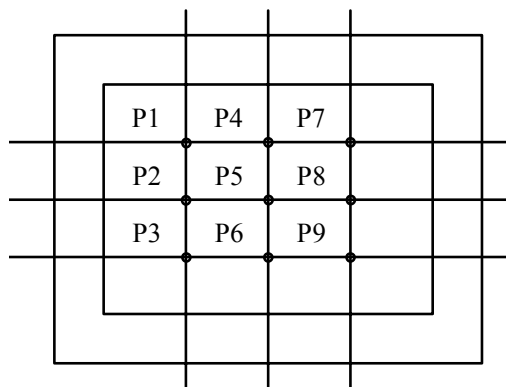
6. OPTICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 V

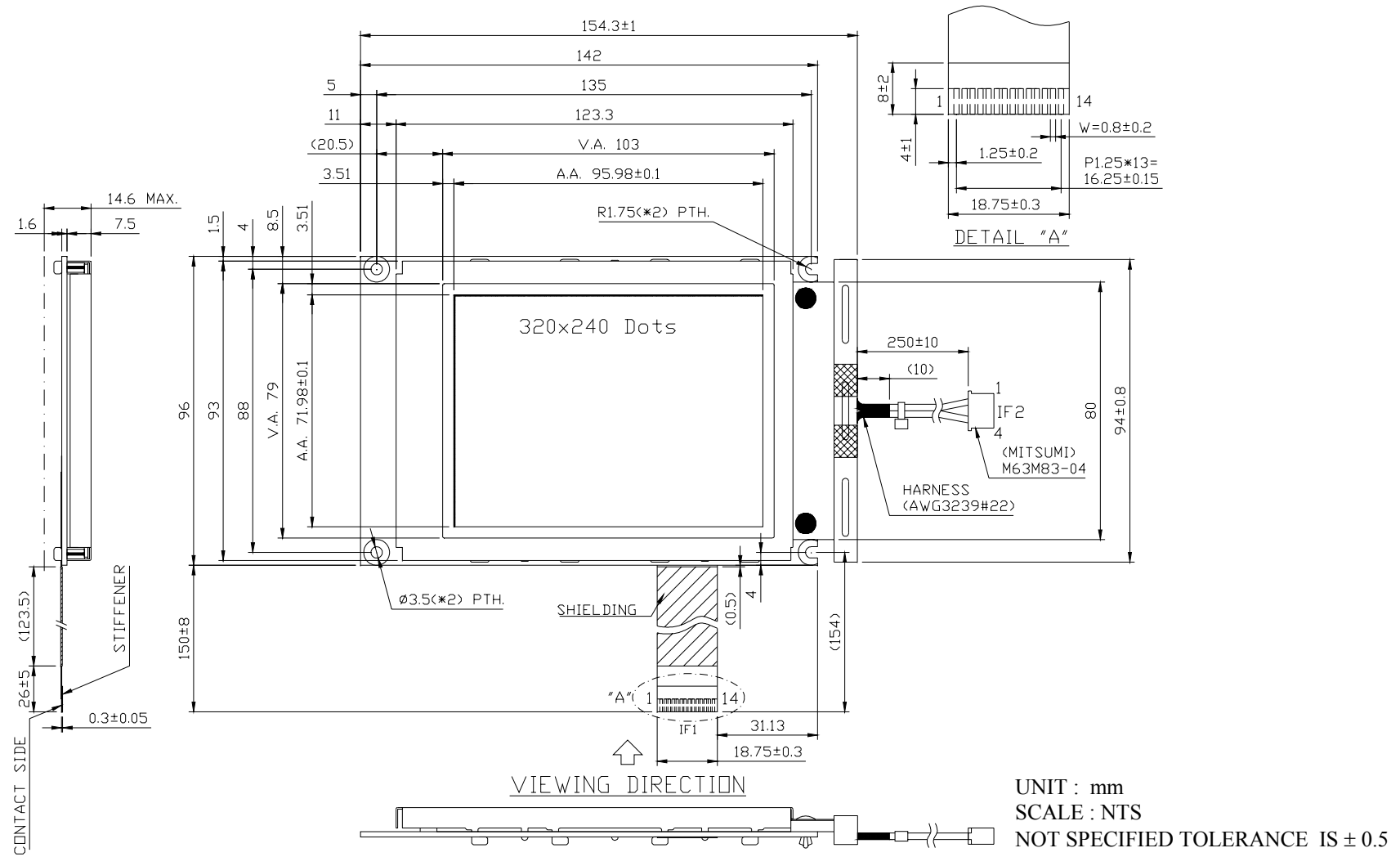
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE	
VIEWING ANGLE	$\theta_{y+}$	K $\geq$ 2.0	$\theta_{x=0^\circ}$	26	31	—	deg.	1
	$\theta_{y-}$			29	34	—		
	$\theta_{x+}$		$\theta_{y=0^\circ}$	19	24	—		
	$\theta_{x-}$			32	37	—		
CONTRAST RATIO	K	$\theta_{y-}=10^\circ$ $\theta_{x=0^\circ}$	4	6	—	—	1	
RESPONSE TIME	tr ( rise )	$\theta_{y-}=10^\circ$ $\theta_{x=0^\circ}$	Ta=-10°C	—	4790	6227	ms	1
			Ta= 25°C	—	280	364		
			Ta= 60°C	—	105	137		
	tf ( fall )		Ta=-10°C	—	2705	3517		
			Ta= 25°C	—	190	247		
			Ta= 60°C	—	80	104		
BRIGHTNESS OF MODULE	L	—	60	90	—	cd /m <sup>2</sup>	2, 3	
RISE TIME OF BACKLIGHT	TC	—	—	5	—	MINUTE		
BRIGHTNESS UNIFORMITY	—	—	80	—	—	%	4, 5	

- NOTE (1) : PLEASE REFER TO :  
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU - 002B)
- NOTE (2) : MEASUREMENT AFTER 10 MINUTES OF CCFL OPERATING.
- NOTE (3) : POLARIZER MODE : TRANSMISSIVE
- NOTE (4) : MEASUREMENT OF THE FOLLOWING 9 PLACES ON THE DISPLAY.  
DEFINITION OF THE BRIGHTNESS TOLERANCE .

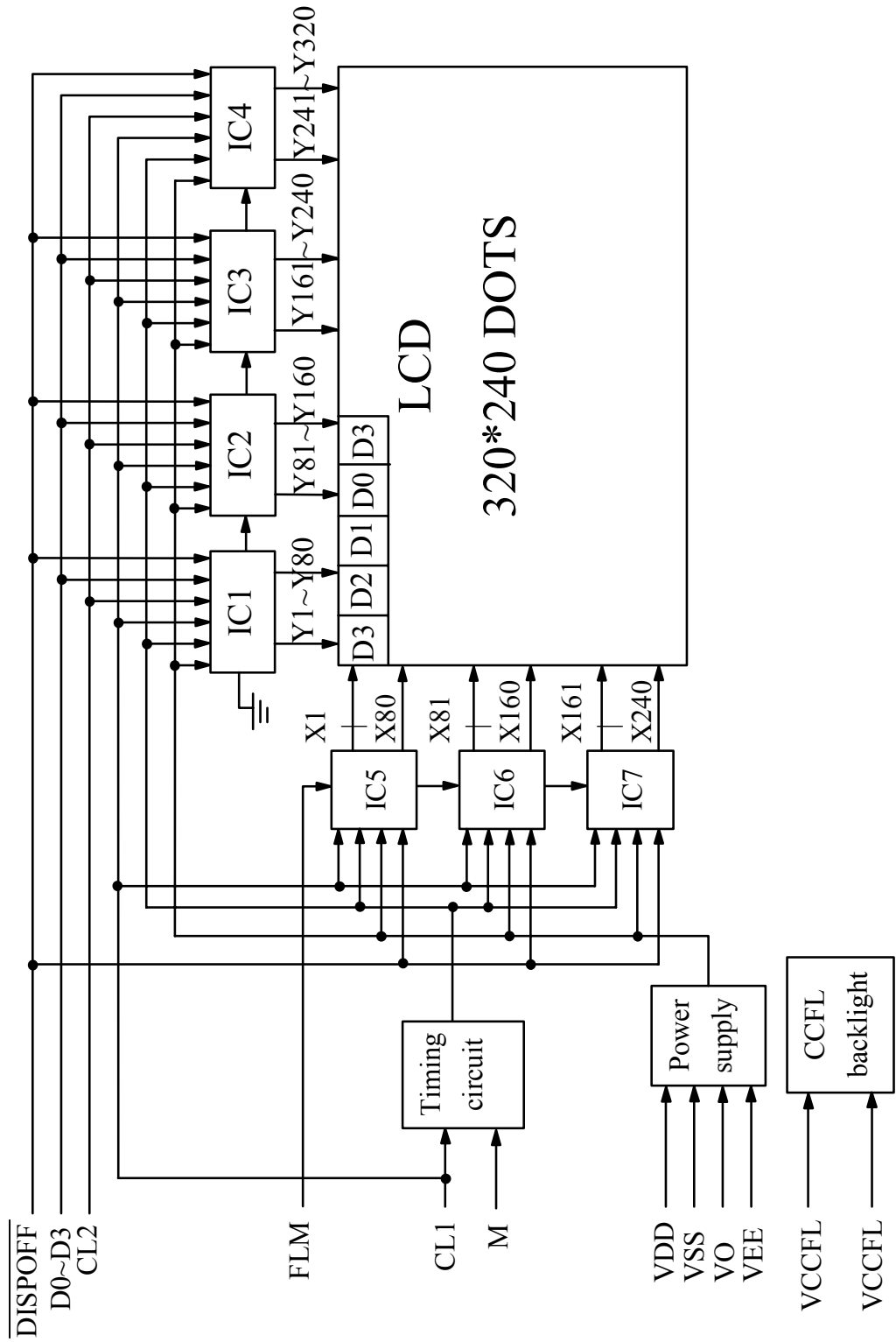


- NOTE (5) : BRIGHTNESS UNIFORMITY IS DEFINED AS FOLLOWING  
( MIN. / MAX. )  $\times$  100 %

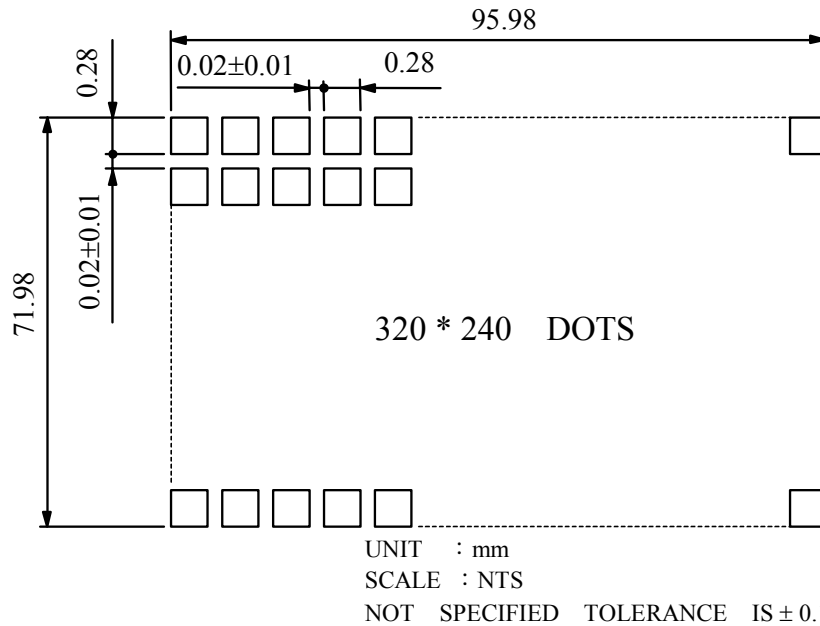
7. OUTLINE DIMENSIONS



8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



10. INTERFACE SIGNALS

IF1 :

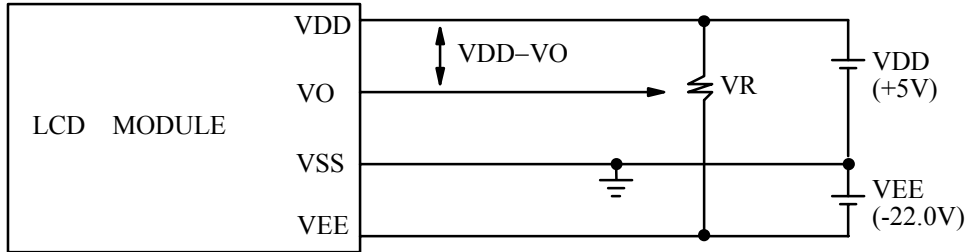
PIN NO	SYMBOL	LEVEL	FUNCTION
1	FLM	H	THE FLM SIGNAL INDICATING THE BEGINNING OF EACH DISPLAY CYCLE
2	M	H / L	CONTROL SIGNAL FOR AC DRIVING
3	CL1	H → L	DISPLAY DATA LATCH
4	CL2	H → L	DISPLAY DATA SHIFT
5	DISPOFF	H / L	H : DISPLAY ON , L : DISPLAY OFF
6	D0	H / L	DISPLAY DATA
7	D1	H / L	
8	D2	H / L	
9	D3	H / L	
10	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT
11	VSS	—	GROUND
12	VEE	—	POWER SUPPLY FOR LCD DRIVING
13	VO	—	OPERATING VOLTAGE FOR LCD DRIVING
14	FGND	—	FRAME GROUND

IF2 :

PIN NO	ASSIGNMENT	LEVEL	FUNCTION
1	VCCFL	—	POWER SUPPLY FOR CCFL DRIVING
2	NC	—	NO CONNECTION
3	NC	—	NO CONNECTION
4	VCCFL	—	POWER SUPPLY FOR CCFL DRIVING

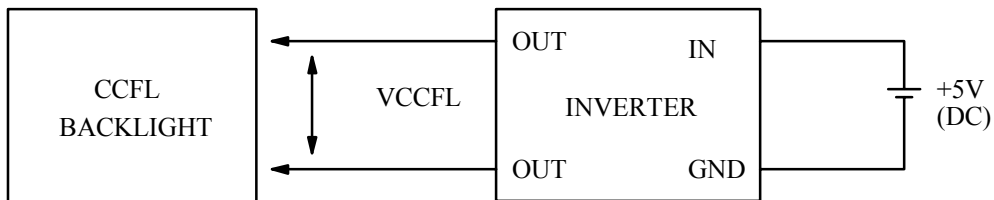
1.1. POWER SUPPLY

1.1.1 POWER SUPPLY FOR LCM



VDD-VO : LCD DRIVING VOLTAGE  
VR : 20KΩ

1.1.2 POWER SUPPLY FOR CCFL BACK - LIGHT



RECOMMENDED INVERTER : 1A-EM02A1

1.1.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

