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APPROVED BY: <i>MS Huang</i>		ISSUE : OCT.27 ,2003
		TOTAL PAGE : 10
		VERSION : 1

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :

 E W 5 0 3 9 7 B C W

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO .	VERSION	PAGE
E W 5 0 3 9 7 B C W	1	0-1

RECORDS OF REVISION	DOC . FIRST ISSUE	OCT,27,2003
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DATE	REVISED PAGE NO.	SUMMARY

MODEL NO .	VERSION	PAGE
E W 5 0 3 9 7 B C W	1	0-2

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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 2 A

1.2 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

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 | ----- | STN , BLUE , TRANSMISSIVE |
| (8) DRIVING METHOD | ----- | 1 / 240 DUTY MULTIPLEX DRIVE |
| (9) 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	32.0	V	
INPUT VOLTAGE	VI	(VSS-0.3)	(VDD+0.3)	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 (2), (3)
HUMIDITY	—	95 % RH	—	95 % 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)	10 mSECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -20°C: 48HR MAX .
70°C: 168HR MAX .

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

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

4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 V

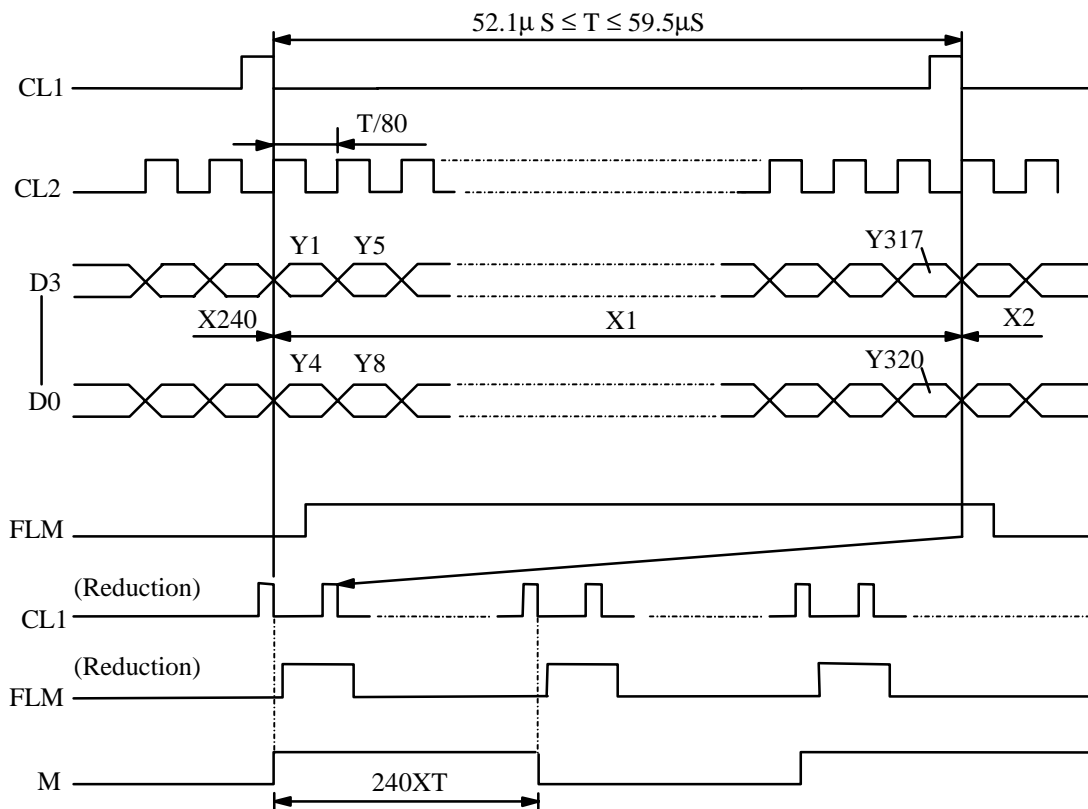
PARAMETER	SYMBOL	CONDITION	MIN .	TYP.	MAX .	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD - VSS	—	4.75	5.0	5.25	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VDD - VEE	—	—	30	—	V
INPUT VOLTAGE NOTE (1)	VIH	H LEVEL	0.8*VDD	—	—	V
	VIL	L LEVEL	—	—	0.2*VDD	V
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD-VSS = 5.0 V VDD-VO = (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 NOTE (3)	VDD-VO ∅ = 10° θ = 0° DUTY = 1/240	Ta = -10 °C	—	(24.6)	—	V
		Ta = 25 °C	(20.6)	(21.6)	(22.6)	V
		Ta = 60 °C	—	(16.6)	—	V
CLOCK OSCILLATION FREQUENCY	f FLM	—	70	75	80	HZ
POWER SUPPLY FOR CCFL	VOLTAGE	VCCFL	—	—	300	Vrms
	FREQUENCY	f CCFL	—	—	30K	HZ
	CURRENT	IL	—	—	5	mA
	LIFE TIME	L	IL = 5.0mA	45000	50000	—

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

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

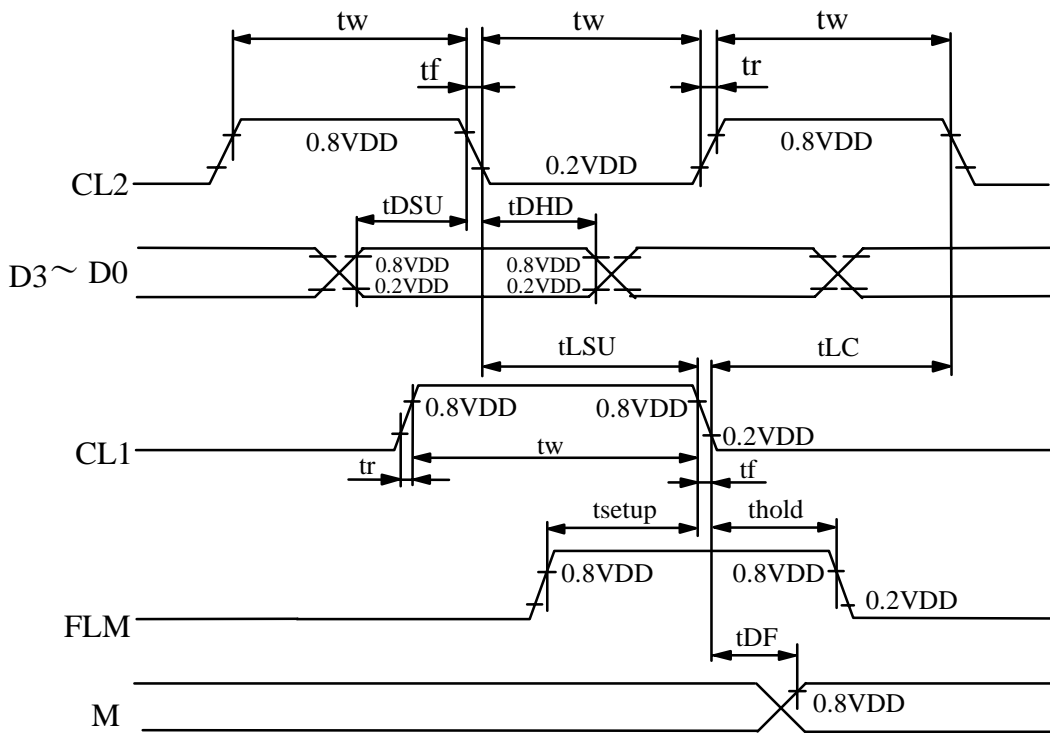
NOTE (3): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ±1.0V BY EACH MODULE.

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

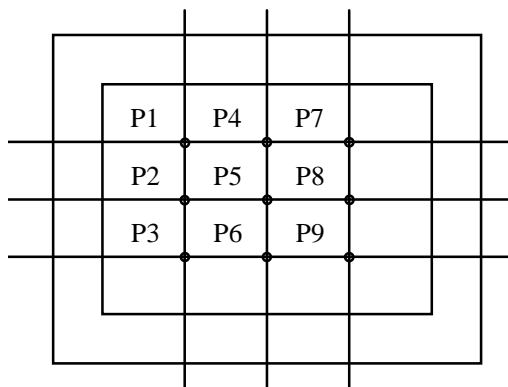
I T E M		SYMBOL	CONDITION	MIN .	TYP .	MAX.	UNIT	NOTE
VIEWING ANGLE	STN	∅ 2 - ∅ 1	K ≥ 2.0	—	40	—	deg.	1
CONTRAST RATIO	STN	K	∅ = 10° θ = 0°	—	10	—	—	1
RESPONSE TIME	tr (rise)	∅=10° θ = 0°	Ta = -10 °C	—	2149	—	ms	1
			Ta = 25 °C	—	228	—		
			Ta = 60 °C	—	124	—		
	tf (fall)		Ta = -10 °C	—	1709	—		
			Ta = 25 °C	—	191	—		
			Ta = 60 °C	—	96	—		
BRIGHTNESS OF MODULE	B	—	(70)	(90)	—	cd / m ²	2 , 3	
RISE TIME OF BACKLIGHT	TC	—	—	5	—	MINUTE		
BRIGHTNESS UNIFORMITY	—	—	—	—	—	20	%	4 , 5

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

NOTE (2) : MEASUREMENT AFTER 10 MINUTES OF CCFL OPERATING.

NOTE (3) : POLARIZER MODE : TRANSMISSIVE

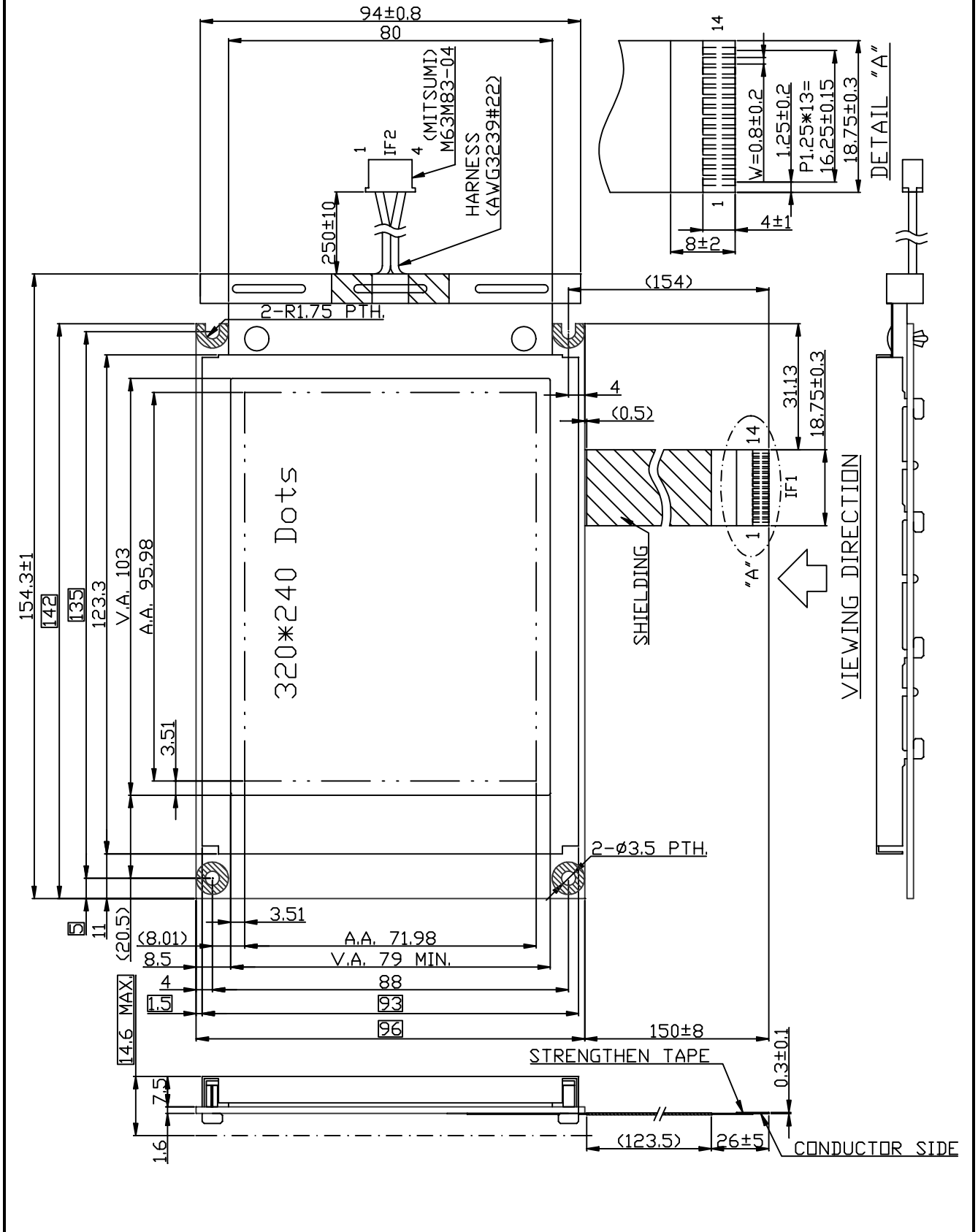
NOTE (4) : MEASUREMENT OF THE FOLLOWING 9 PLACES ON THE DISPLAY.
DEFINITION OF THE BRIGHTNESS TOLERANCE .



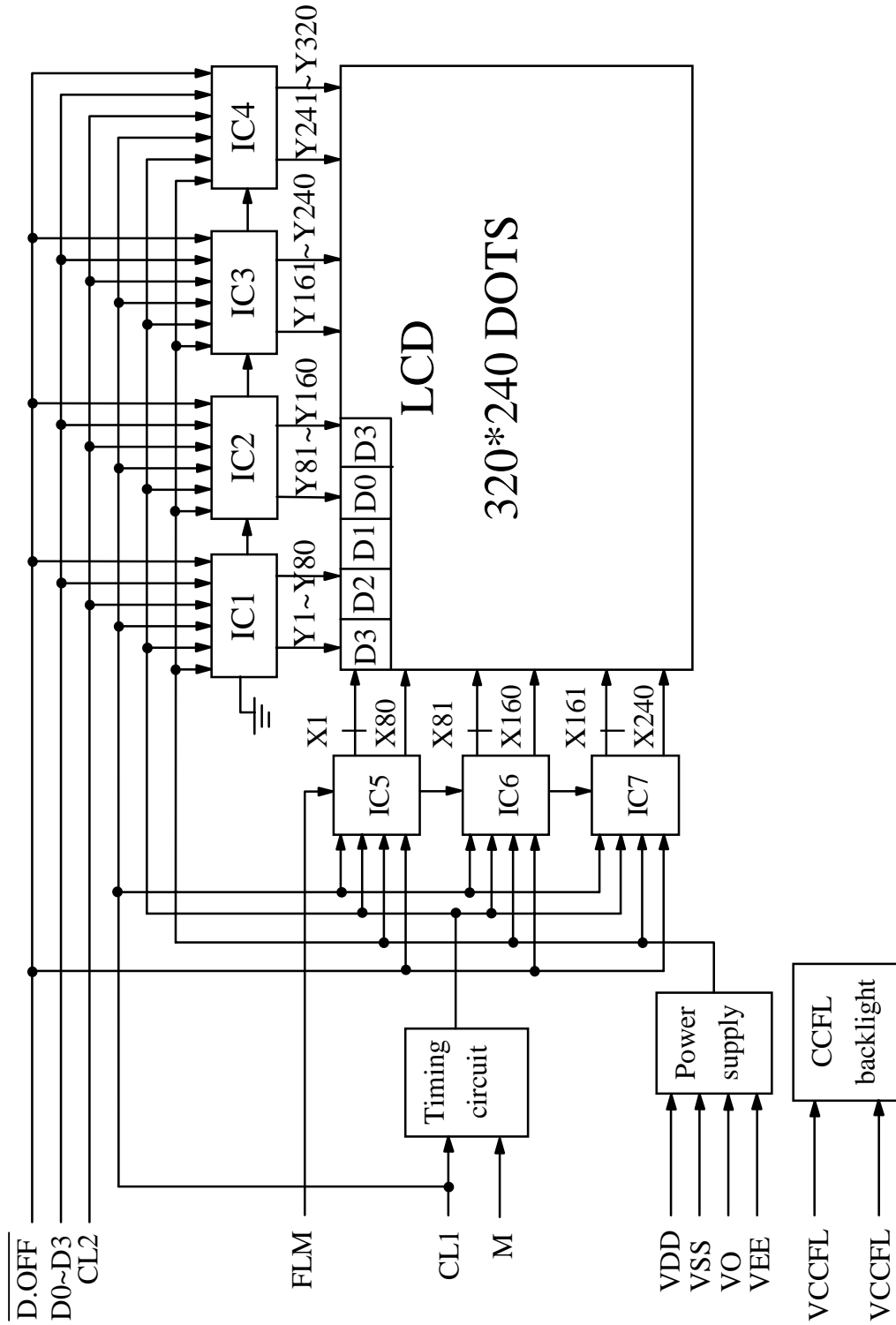
NOTE (5) : BRIGHTNESS UNIFORMITY IS DEFINED AS FOLLOWING

$$\sum X = \left[\frac{(\text{MAXIMUM BRIGHTNESS OR MINIMUM BRIGHTNESS}) - \text{AVERAGE BRIGHTNESS}}{\text{AVERAGE BRIGHTNESS}} \right] \times 100\%$$

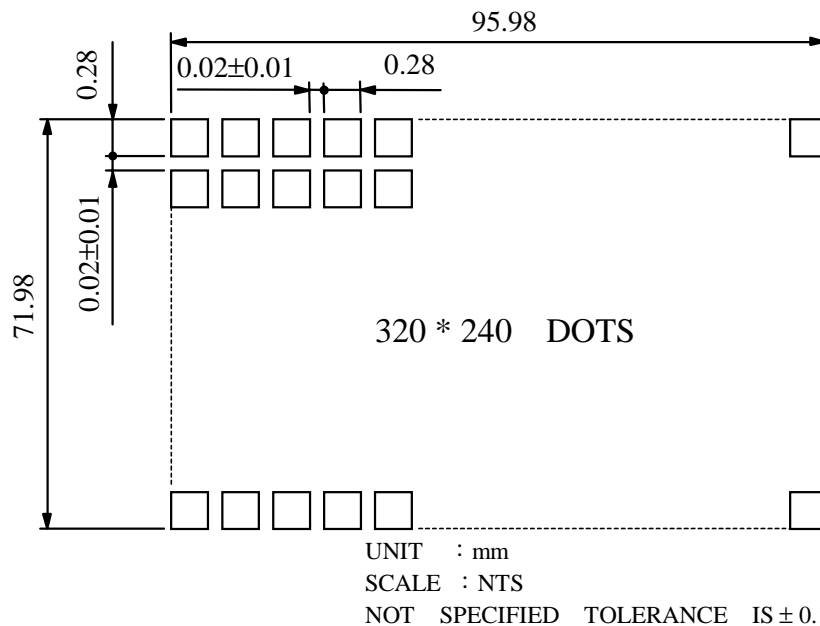
7. OUTLINE DIMENSIONS



8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



10. INTERFACE SIGNALS

IF1 :

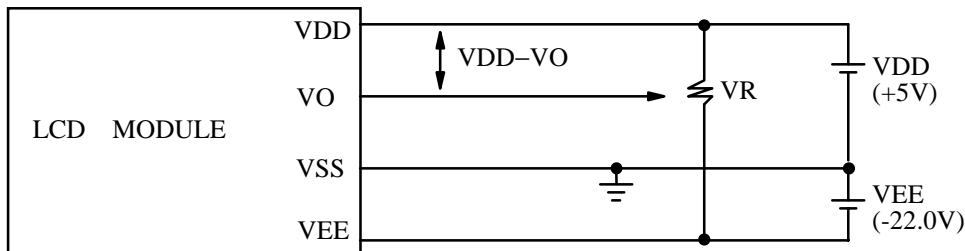
PIN NO	SYMBOL	LEVEL	FUNCTION
1	FLM	H	THE FLM SIGNAL INDICATING THE BEGINNING OF EACH DISPLAY CYCLE
2	M	H / L	CONTROL SIGNAL FOR AC DRIVING
3	CL1	H → L	DISPLAY DATA LATCH
4	CL2	H → L	DISPLAY DATA SHIFT
5	$\overline{\text{D.OFF}}$	H / L	H : DISPLAY ON , L : DISPLAY OFF
6	D0	H / L	DISPLAY DATA
7	D1	H / 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	FG	—	FRAME GROUND

IF2 :

PIN NO	ASSIGNMENT	LEVEL	FUNCTION
1	GND	—	POWER SUPPLY FOR CCFL DRIVING
2	NC	—	NO CONNECTION
3	NC	—	NO CONNECTION
4	H.V.	—	POWER SUPPLY FOR CCFL DRIVING

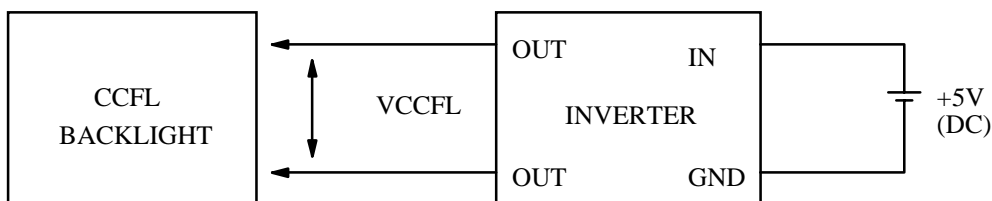
1 1 . POWER SUPPLY

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 : IA-EM02A

1 1 . 3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

