



富相科技股份有限公司

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PART NO : GG3224N0FUC1S(LM6430EBE)
FOR MESSRS : _____

CONTENTS

NO.	ITEM	PAGE
1.	COVER	1
2.	RECORD OF REVISION	2
3.	GENERAL SPECIFICATIONS AND MECHANICAL DATA	3
4.	ABSOLUTE MAXIMUM RATINGS	4
5.	ELECTRICAL CHARACTERISTICS	5
6.	OPTICAL CHARACTERISTICS	6~7
7.	BLOCK DIAGRAM	8
8.	TIMING CHARACTERISTICS	9~10
9.	DIMENSIONAL OUTLINE	11~12
10.	POWER SUPPLY FOR LCD MODULE	13~14

Accepted by : _____

Proposed by :  _____

Date : 09,12,2002

RECORD OF REVISION

DATE	PAGE	SUMMARY

3. GENERAL SPECIFICATIONS AND MECHANICAL DATA

3.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (SP-10-000)".

3.2 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS.

3.3 MECHANICAL DATA

- (1) NUMBER OF DOTS ----- 320W*240H DOTS
- (2) MODULE SIZE ----- 174.0W*112.0H*14.0D (MAX.) mm
- (3) VIEWING AREA ----- 122.0W*92.0H mm
- (4) DISPLAY AREA ----- 115.17W*86.37H mm
- (5) DOT SIZE ----- 0.33W*0.33H mm
- (6) DOT PITCH ----- 0.36W*0.36H mm
- (7) VIEWING DIRECTION----- 6 O'CLOCK
- (8) LCD TYPE ----- FSTN ,NEGATIVE TYPE,
TRANSMISSIVE
- (9) LCD COLOR ----- BLACK/WHITE
- (10) BACK LIGHT -----CCFL

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	-0.3	7.0	V	
POWER SUPPLY FOR LCD DRIVE	VDD-VEE	0	30	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)

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

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	0℃	50℃	-20℃	60℃	NOTE (2)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	— —	4.9 m/s ² (0.5G)	— —	19.6 m/s ² (2G)	10~300HZ XYZ DIRECTIONS 1 Hr.EACH
SHOCK	— —	29.4 m/s ² (3G)	— —	49.0 m/s ² (5G)	10 mSEC XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE(2) : Ta AT -20℃ : 48HR MAX.
60℃ : 168HR MAX.

NOTE(3) : Ta ≤ 40℃ : 85% RH MAX.
Ta > 40℃ : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE
HUMIDITY OF 85%RH AT 40℃ . (50%RH AT 50℃)

5. ELECTRICAL CHARACTERISTICS

VDD = 5.0 ± 0.25V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
LOGIC CIRCUIT POWER SUPPLY VOLTAGE	VDD-VSS	-----	4.75	5.0	5.25	V
LCD DRIVER CIRCUIT POWER SUPPLY VOLTAGE	VEE-VSS	-----	-11.0	-16.0	-20.0	V
INPUT VOLTAGE NOTE (1)	VIH	H LEVEL	0.8*VDD	-----	VDD	V
	VIL	L LEVEL	0	-----	0.2*VDD	V
LOGIC CIRCUIT POWER SUPPLY CURRENT NOTE (2)	IDD	VDD-VSS=5.0V VEE-VSS =-16.0V	-----	7.0	-----	mA
LCD DRIVER CIRCUIT POWER SUPPLY CURRENT NOTE (2)	IEE	VDD-VSS=5.0V VEE-VSS =-16.0V	-----	4.0	-----	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (3)	VDD - VO Φ=10° θ=0° DUT = 1/240	Ta = 0°C	-----	-----	-----	v
		Ta = 25°C	-----	21.0	-----	v
		Ta = 50°C	-----	-----	-----	v
FLM FREQUENCY	fFLM	-----	70.0	75.0	80.0	HZ
THE POWER SUPPLY FOR CCFL	VCCFL	fCCFL = 30 KHz	-----	300.0	-----	Vrms
	ICCFL	-----	-----	5.0	-----	mA

NOTE(1) : APPEND TO TERMINALS FLM,CL1,CL2,D0~D3

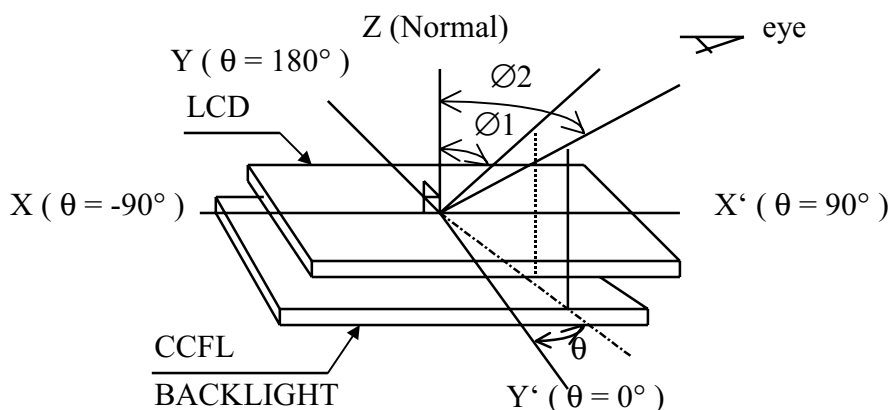
NOTE(2) : THE DISPLAY PATTERN IS ALL “Q”

NOTE(3) : RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE
ABOUT ± 0.5V BY EACH MODULE

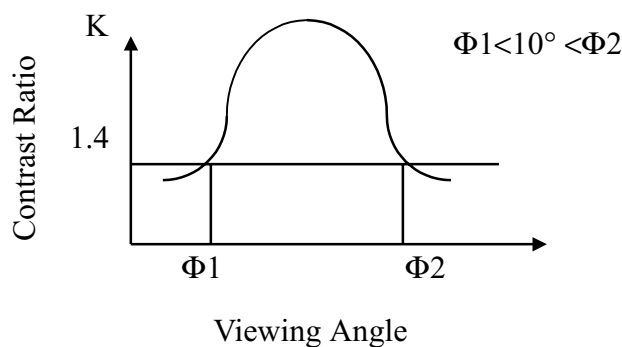
6. OPTICAL CHARACTERISTICS

Ta = 25°C		VDD = 5.0		VDD-VO=21.0V			
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	$\Phi 2-\Phi 1$	$K \geq 1.4$	-----	40	-----	deg.	1,2
CONTRAST RATIO	K	$\Phi = 10^\circ$ $\theta = 0^\circ$	3	5	-----	-----	3
RESPONSE TIME	tr(rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	250	400	ms	4
	tf(fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	350	450	ms	4
THE BRIGHTNESS OF BRIGHTNESS SOURCE	B	$\Phi = 10^\circ \theta = 0^\circ$	130	-----	-----	cd/m ²	5

NOTE (1) : DEFINITION OF θ AND Φ



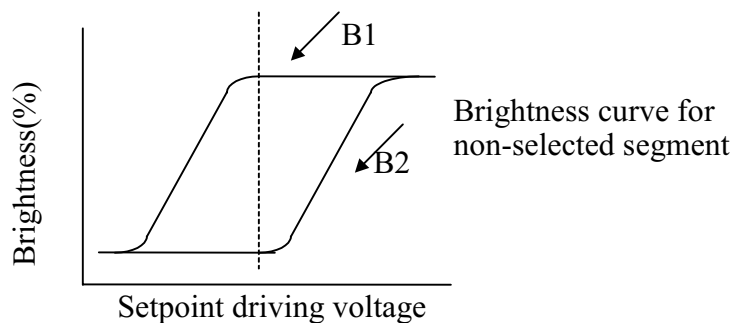
NOTE (2) : DEFINITION OF VIEWING ANGLE $\Phi 1$ AND $\Phi 2$



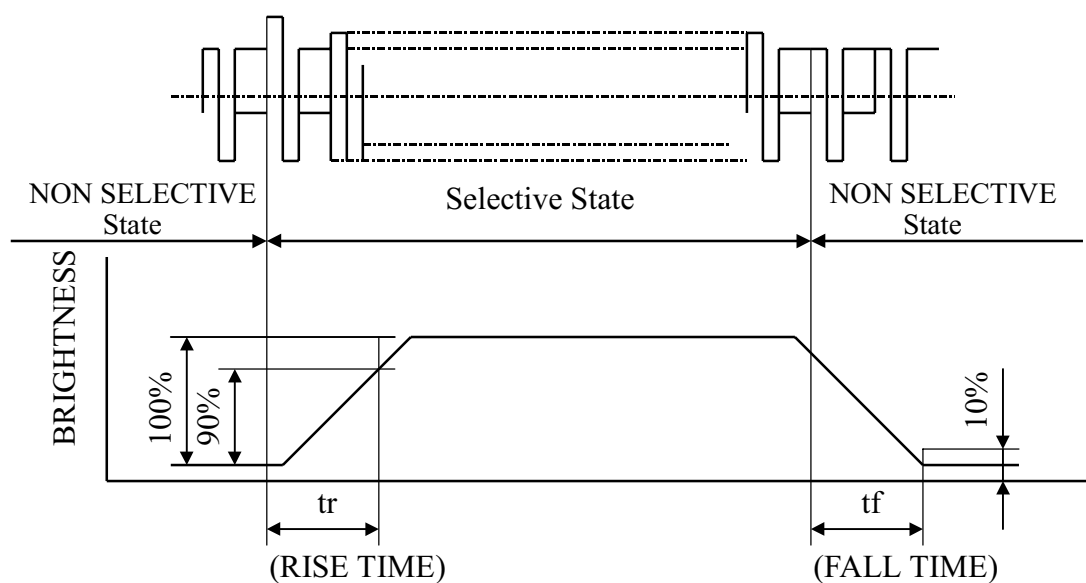
NOTE (3) : DEFINITION OF CONTRAST“K”

$$K = \frac{\text{Brightness of selected segment}(B1)}{\text{Brightness of non-selected segment}(B2)}$$

Brightness curve for selected segment

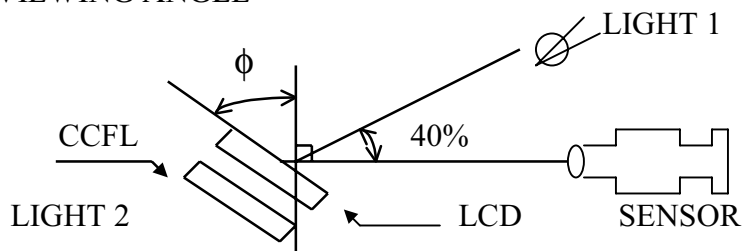


NOTE(4) : DEFINITION OF OPTICAL RESPONSE

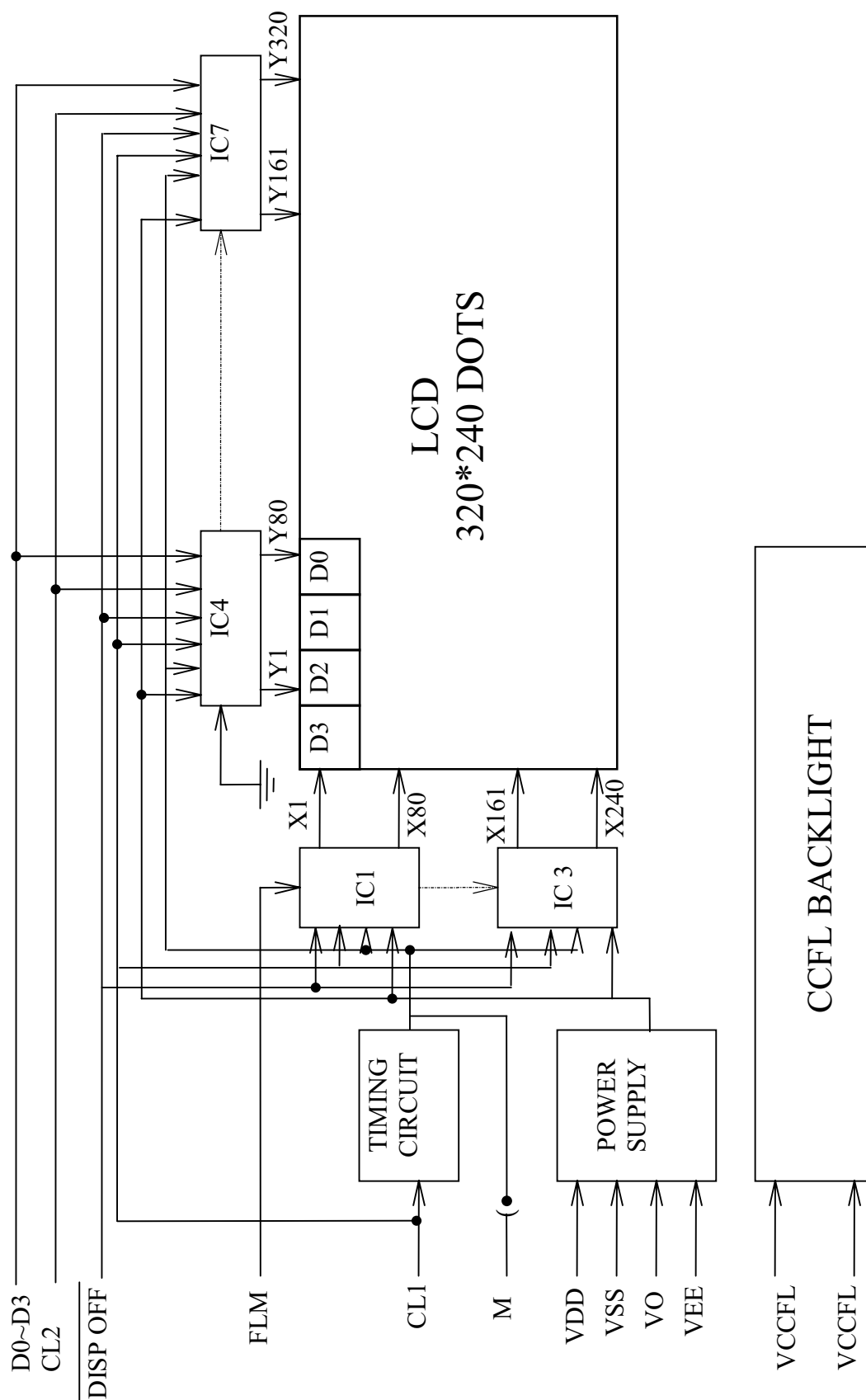


NOTE(5) : OPTICAL OF LIGHT

VIEWING ANGLE

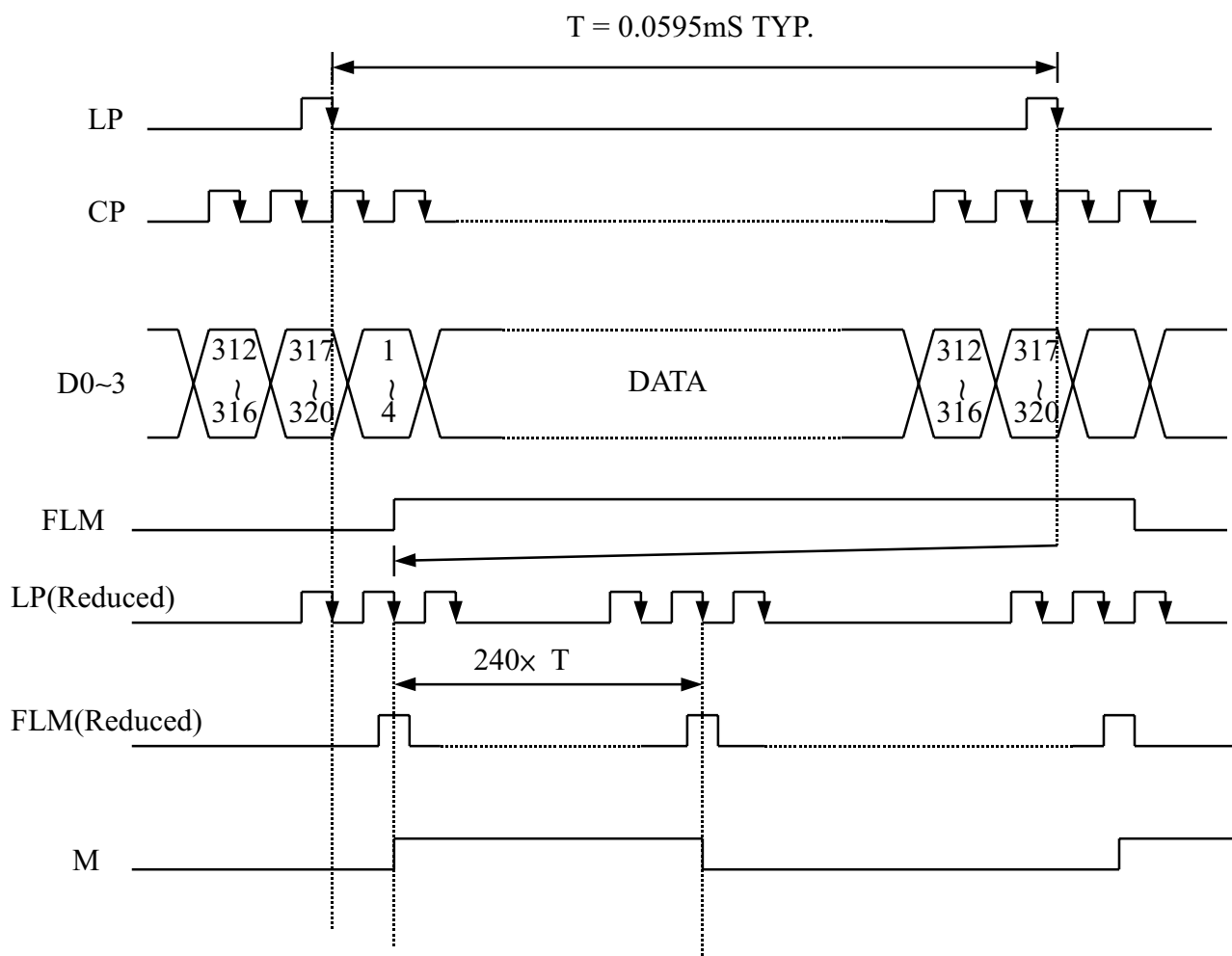


7.BLOCK DIAGRAM



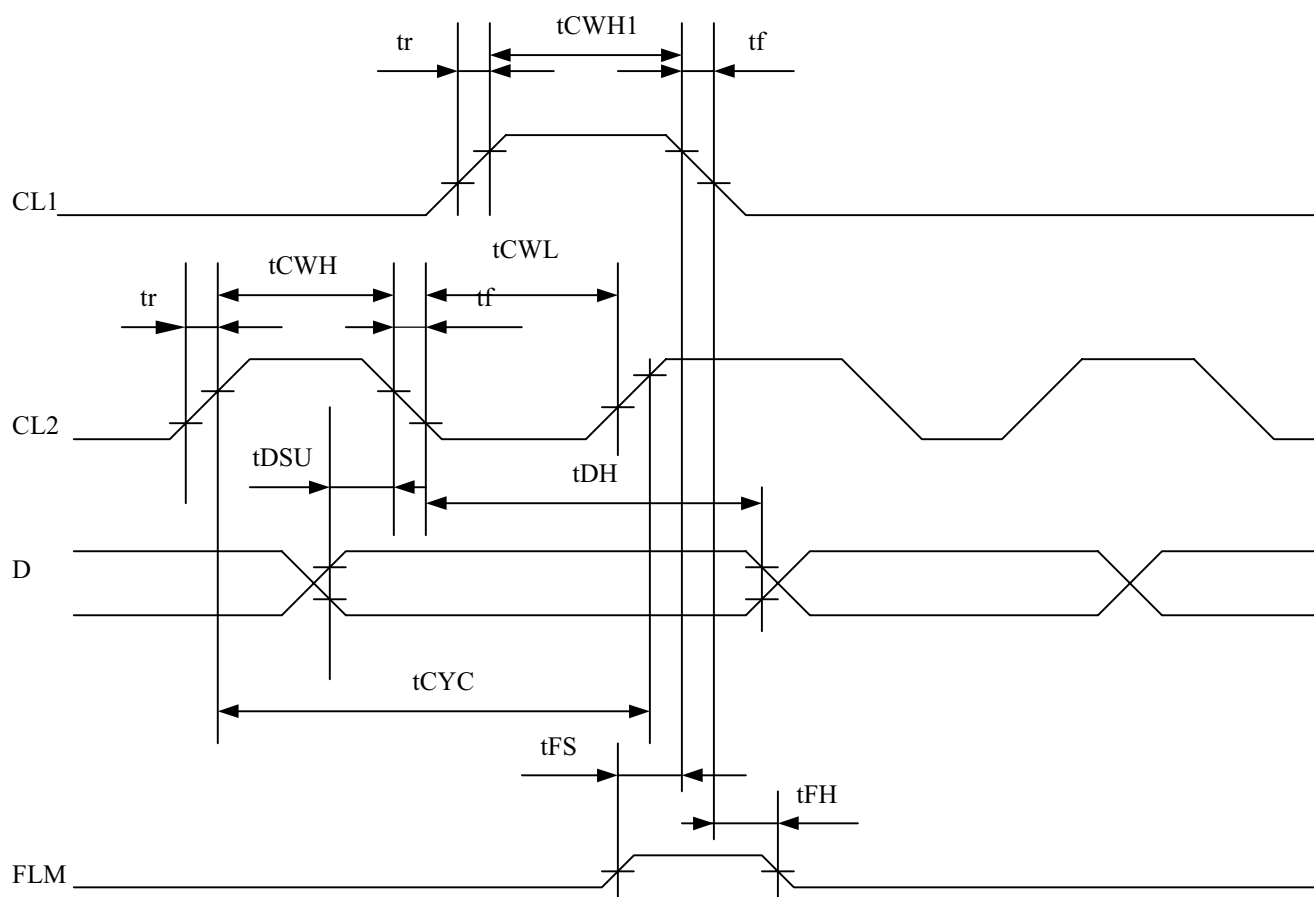
8. TIMING CHARACTERISTICS

8.1 INTERFACE TIMING.



8.2 INTERFACE TIMING

I T E N	SYMBOL	MIN.	TYP	MAX.	UNIT
CL2 cycle time	tCYC	300	-----	-----	ns
CL2 pulse width (H)	tCWH	100	-----	-----	ns
CL2 pulse width (L)	tCWL	100	-----	-----	ns
CL1pulse width (H)	tCWH1	63	-----	-----	ns
CLOCK rise/fall time	tr , tf	-----	-----	50	ns
Data set up time	tDSU	100	-----	-----	ns
Data hold time	tDH	100	-----	-----	ns
CL1 delay time	tCL	150	-----	-----	ns
FLM set up time	tFS	200	-----	-----	ns
FLM hold time	tFH	200	-----	-----	ns

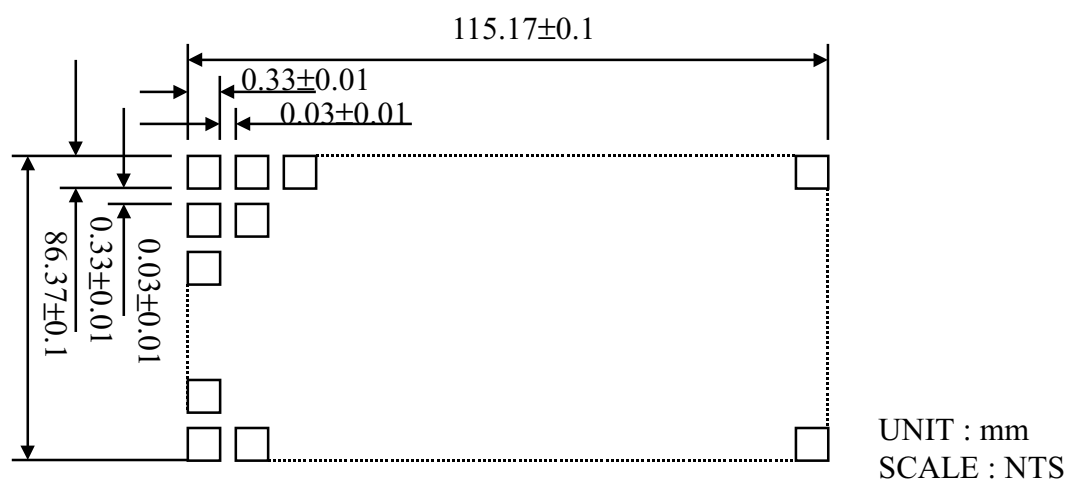


9.1 INTERFACE PIN CONNECTION

CN1: CN2: INTERFACE PIN CONNECTION			
PIN NO.	SYMBOL	LEVEL	FUNCTION
1	FLM	H/L	FRAME SIGNAL
2	CL1	H → L	DATA LATCH SIGNAL
3	CL2	H → L	DATA SHIFT CLOCK SIGNAL
4	M/NC	-----	CONTROL SIGNAL FOR AC DRIVING/NC
5	VO	-----	POWER SUPPLY FOR LCD CONTROL
6	VDD	-----	POWER SUPPLY FOR LOGIC CIRCUIT
7	VSS	-----	GROUND
8	VEE	-----	POWER SUPPLY FOR LCD DRIVING
9	DO	H/L	DISPLAY DATA
10	D1	H/L	
11	D2	H/L	
12	D3	H/L	
13	DISPOFF	H/L	H : DISPLAY ON L : DISPLAY OFF
14	NC	-----	NO CONNECTION

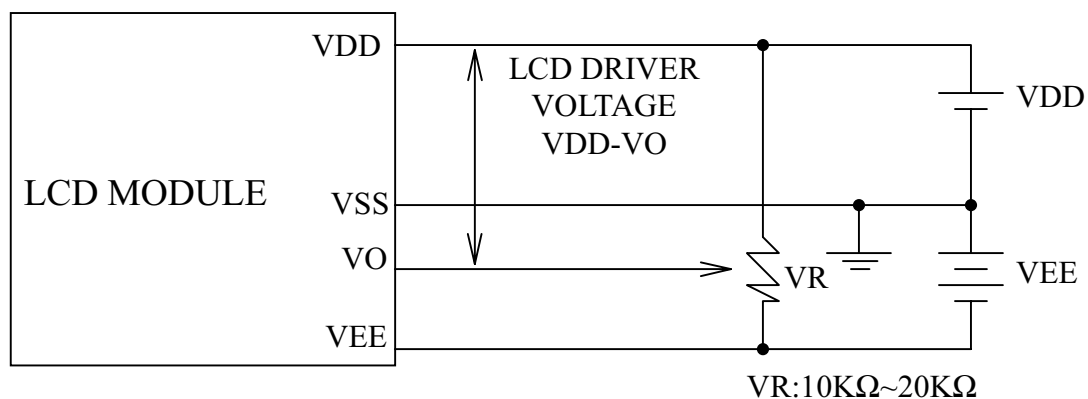
CN3 : INTERFACE PIN CONNECTION				
PIN NO	1	2	3	4
SYMBOL	VCCFL	NC	NC	VCCFL

9.2 DISPLAY PATTERN

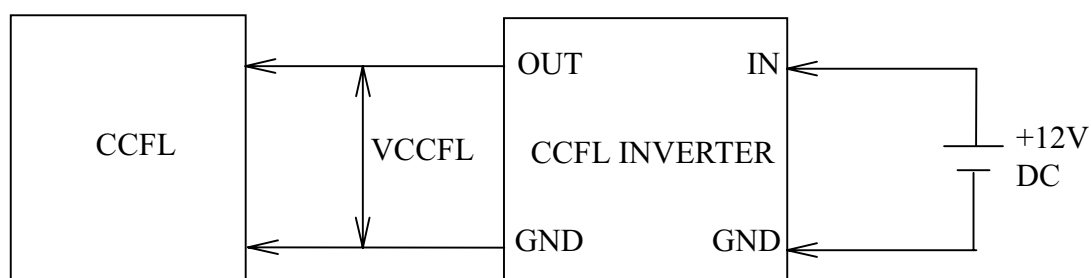


10. POWER SUPPLY FOR LCD MODULE

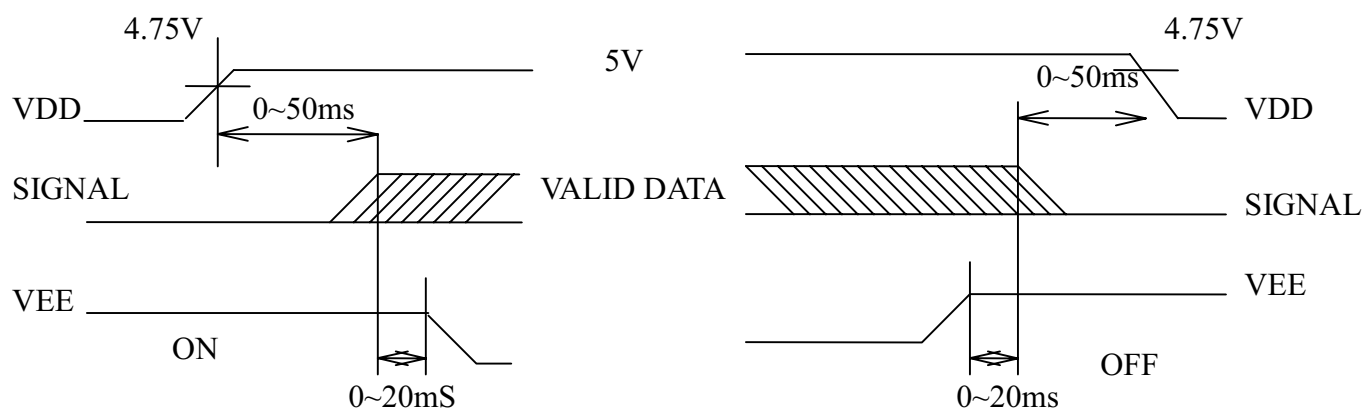
10.1 POWER SUPPLY FOR LCM



10.2 POWER SUPPLY FOR CCFL



10.3 POWER AND INTERFACE TIMING SEQUENCE



10.4 SUGGEST CONTROLLER

LM6430SBF

RECOMMENDED MAX LINE LENGTH
5M

MSM6255
SED1330
HD64646