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<i>Yung Chang Hu</i>		ISSUE : JUL.17,2006
APPROVED BY:		TOTAL PAGE : 15
<i>David Chang</i>		VERSION : 2
CUSTOMER	ACCEPTANCE	SPECIFICATIONS
MODEL NO. : <u>ER057005(CCFL TYPES)</u> (RoHS) FOR MESSRS : _____		
CUSTOMER'S APPROVAL DATE : _____ BY : _____		

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RECORDS OF REVISION

DOC . FIRST ISSUE

NOV.15,2005

DATE

REVISED
DRAWING
NO.

SUMMARY

JUL.17,2006

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3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.
DELETE (AT Ta = 25°C)

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4.1 ELECTRICAL CHARACTERISTICS OF LCM

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
LOGIC CIRCUIT POWER SUPPLY	VDD-VSS	—	3.15	3.3	3.45	V
CONTRAST ADJUSTMENT VOLTAGE	VCON	$\theta_x=0^\circ, \theta_y=0^\circ$ DUTY=1/240 VDD=3.3V/5.0V	0 °C 25 °C 60 °C	1.5 2.0 2.0	— — 2.5	V
SUPPLY CURRENT FOR LOGIC NOTE(2)	IDD	VDD-VSS=5.0/3.3V	—	60	85	mA

↓

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
LOGIC CIRCUIT POWER SUPPLY	VDD-VSS	—	4.5 3.15	5.0 3.3	5.5 3.45	V
CONTRAST ADJUSTMENT VOLTAGE	VCON	$\theta_x=0^\circ, \theta_y=0^\circ$ DUTY=1/240 VDD=3.3V	0 °C 25 °C 60 °C	1.5 2.0 2.0	— — 2.5	V
SUPPLY CURRENT FOR LOGIC NOTE(2)	IDD	VDD-VSS=3.3V	—	60	85	mA

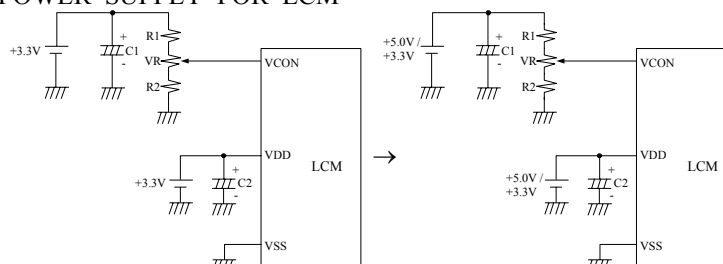
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ADD

5.2.2 SWITCHING CHARACTERISTICS OF VDD=5.0V

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11.1 POWER SUPPLY FOR LCM



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NUMBERING SYSTEM

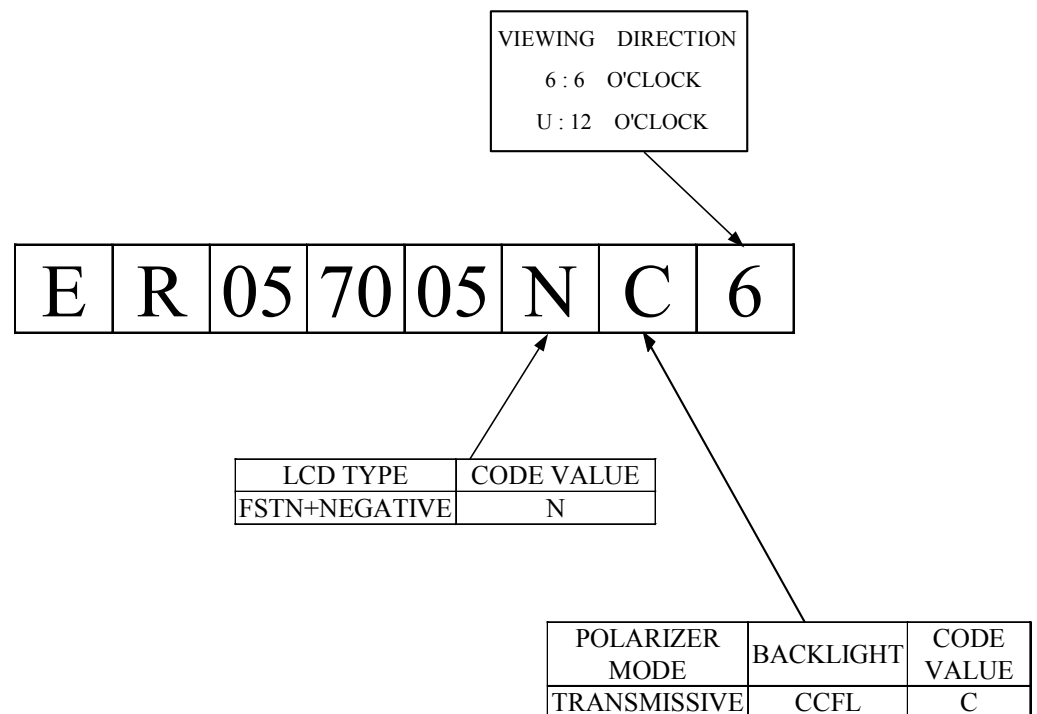


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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 6 B

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 SPECIFICATION

- (1) DISPLAY SIZE ----- 5.7 inches
- (2) NUMBER OF DOTS ----- 320W * (RGB) * 240H pixels
- (3) MODULE SIZE ----- 167W * 109H * 8.9D mm
(WITHOUT CCFL'S CABLE & FFC)
- (4) VIEWING AREA ----- 118.18W * 89.38H mm
- (5) ACTIVE AREA ----- 115.17W * 86.37H mm
- (6) PIXEL SIZE ----- 0.33Wmm * 0.33H mm
- (7) PIXEL PITCH ----- 0.36Wmm * 0.36H mm
- (8) DOT SIZE ----- 0.09Wmm * 0.33H mm
- (9) DOT PITCH ----- 0.12Wmm * 0.36H mm
- (10) LCD TYPE *
- (11) DRIVING METHOD ----- 1 / 240 DUTY MULTIPLEX DRIVE
- (12) BACKLIGHT*
- (13) VIEWING DIRECTION *
- (14) TEMPERATURE COMPENSATION CIRCUIT IS BUILT-IN

* PLEASE REFER TO NUMBERING SYSTEM

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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	
CONTRAST ADJUSTEMENT VOTAGE	VCON	1.0	3.0	V	
INPUT VOLTAGE	VI	-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	0 °C	60 °C	-20 °C	70 °C	NOTE (2),(3),(4)
HUMIDITY	NOTE (5)		NOTE (5)		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 : 120HR 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

NOTE (5) : 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).

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4. ELECTRICAL CHARACTERISTICS

4.1 ELECTRICAL CHARACTERISTICS OF LCM

Ta=25°C

ITEM		SYMBOL	CONDITION		MIN.	TYP.	MAX	UNIT
LOGIC CIRCUIT POWER SUPPLY		VDD-VSS	—		4.5	5.0	5.5	V
					3.15	3.3	3.45	
INPUT VOLTAGE NOTE(1)		VIH	H LEVEL		0.8VDD	—	VDD	V
		VIL	L LEVEL		0	—	0.2VDD	
OUTPUT VOLTAGE NOTE(1)		VOH	H LEVEL		VDD-0.4	—	—	V
		VOL	L LEVEL		—	—	+0.4	V
CONTRAST ADJUSTMENT VOLTAGE		VCON	$\theta_x=0^\circ, \theta_y=0^\circ$ DUTY=1/240 VDD=3.3V/5.0V	0 °C	1.5	2.0	—	V
				25°C	—	2.0	—	
				60°C	—	2.0	2.5	
SUPPLY CURRENT FOR LOGIC NOTE(2)		IDD	VDD-VSS=5.0 / 3.3V		—	60	85	mA
INPUT LEAK CURRENT		ICON	VCON=2.0V		—	—	10	μ A
		I _{IN} NOTE (3)	VIN=VDD OR VSS		—	±10	—	
LCM	SURFACE LUMINANCE	L	PATTERN : (PIXELS ALL ON OF WHITE COLOR)		—	150	—	cd/m ²
			PATTERN : (PIXELS ALL OFF)		—	5	—	
RECOMMENDED FRAME FREQUENCY FOR OPTIMUM CONTRAST		FLM	—		110	120	130	Hz

NOTE(1) : APPLIED TO TERMINALS FLM , CL1 , CL2 , D7~D0 , $\overline{\text{DISPOFF}}$.

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

NOTE(3) : $\overline{\text{DISPOFF}}$, FLM , CL1 , CL2 , D7~D0.

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4.2 ELECTRICAL CHARACTERISTICS OF BACKLIGHT

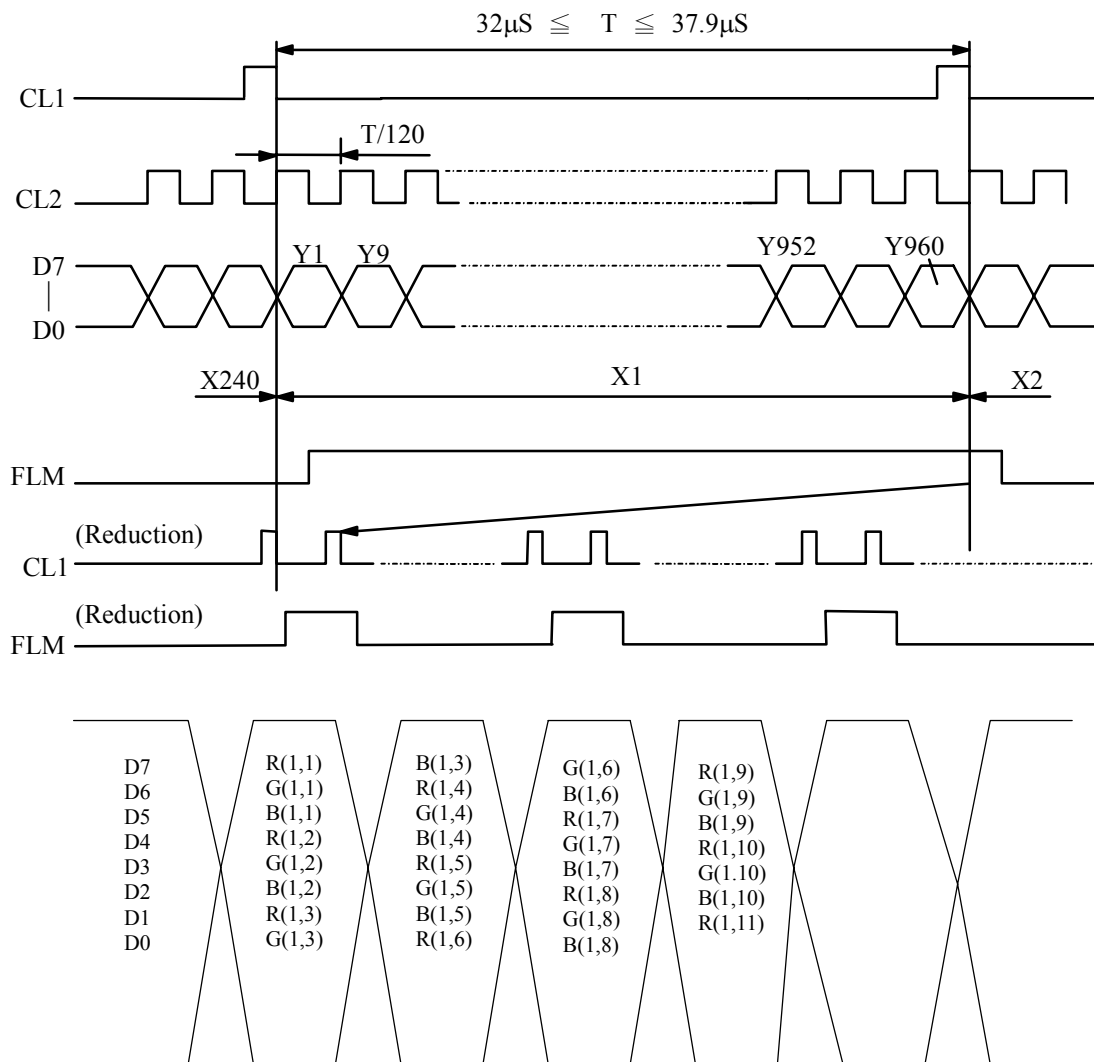
PARAMETER		SYMBOL	MIN.	TYP.	MAX .	UNIT	REMARK
POWER SUPPLY FOR CCFL	LAMP VOLTAGE	V_L	—	250	—	Vrms	—
	LAMP CURRENT	I_L	4.5	5.0	6.0	mA _{rms}	NOTE(1)
	LAMP POWER CONSUMPTION	P_L	—	1.25	—	W	NOTE(2)
	LAMP FREQUENCY	F_L	35	50	60	KHz	
	LAMP LIFE TIME	L_L	25K	35K	—	hrs	IL = 5 mA _{rms}
	STARTING VOLTAGE	V_s	—	—	450	Vrms	Ta=25°C
			—	—	600		Ta=0°C

NOTE (1) : IT IS RECOMMENDED THAT THE LAMP CURRENT WILL NOT BE HIGHER THAN 5mA_{rms} TO MINIMIZE HEAT RADIATION SINCE THIS CAN AFFECT THE DISPLAY QUALITY.

NOTE (1) : POWER CONSUMPTION EXCLUDED INVERTER LOSS.

5. TIMING CHARACTERISTICS

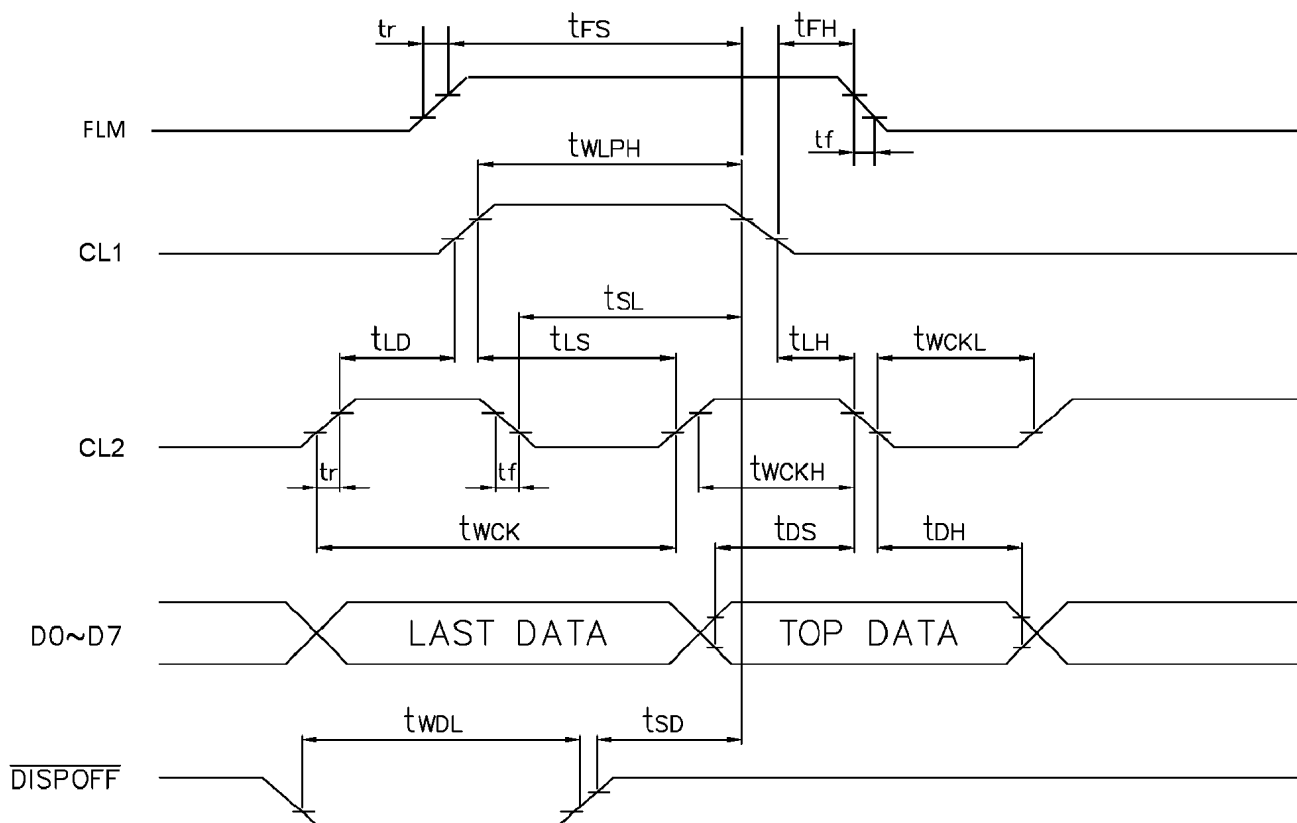
5.1 INTERFACE TIMING



5.2 SWITCHING CHARACTERISTICS

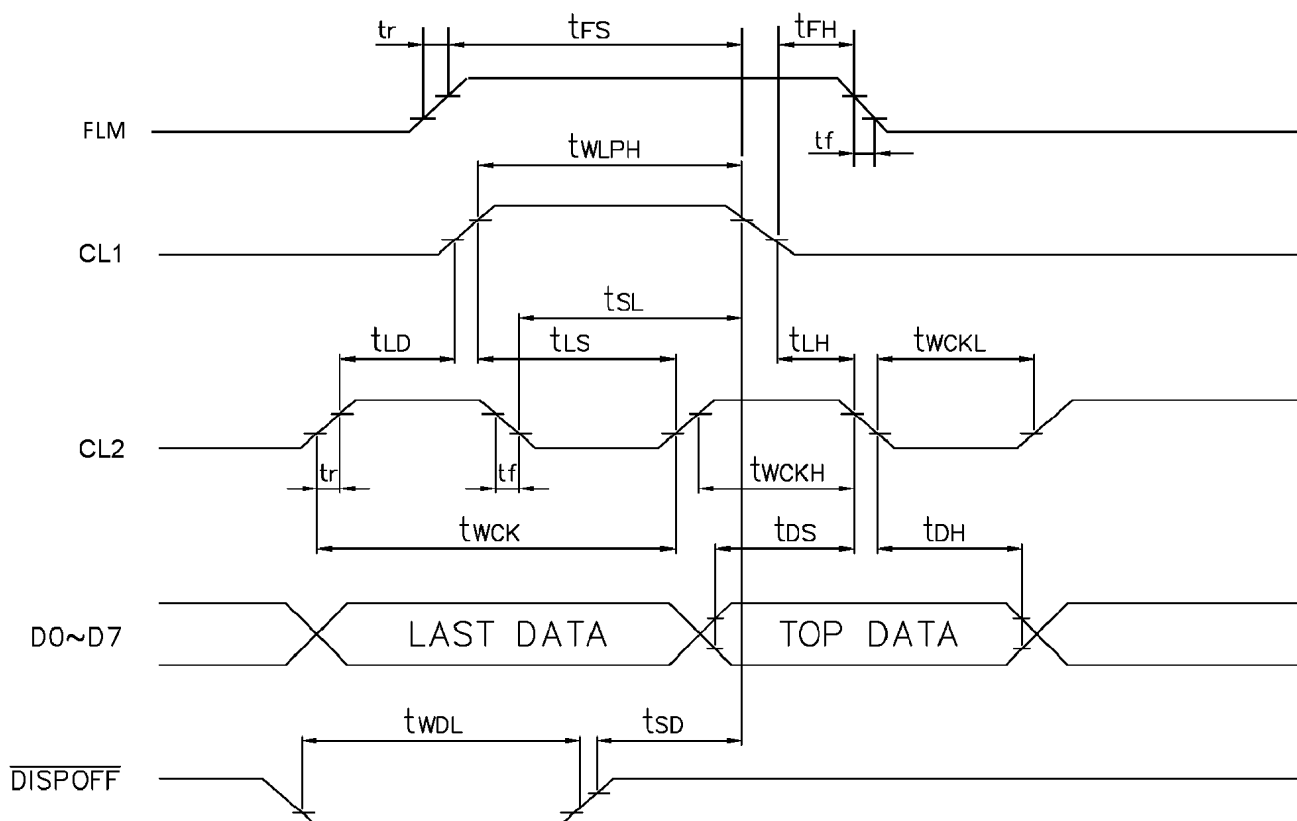
5.2.1 SWITCHING CHARACTERISTICS OF VDD=3.3V

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
CL2 PULSE CYCLE TIME	t_{WCK}	82	—	ns
CL2 PULSE HIGH LEVEL WIDTH	t_{WCKH}	28	—	ns
CL2 PULSE LOW LEVEL WIDTH	t_{WCKL}	28	—	ns
CL1 PULSE HIGH LEVEL WIDTH	t_{WLPH}	30	—	ns
CL2 RISE TO CL1 RISE TIME	t_{LD}	10	—	ns
CL2 FALL TO CL1 FALL TIME	t_{SL}	30	—	ns
CL1 RISE TO CL2 RISE TIME	t_{LS}	30	—	ns
CL1 FALL TO CL2 FALL TIME	t_{LH}	30	—	ns
CLOCK PULSE RISE/FALL TIME	t_r, t_f	—	50	ns
DATA SETUP TIME	t_{DS}	10	—	ns
DATA HOLD TIME	t_{DH}	30	—	ns
FLM SETUP TIME	t_{FS}	30	—	ns
FLM HOLD TIME	t_{FH}	50	—	ns
$\overline{DISPOFF}$ LOW LEVEL WIDTH	t_{WDL}	1.2	—	μs
$\overline{DISPOFF}$ CANCELLATION TIME	t_{SD}	100	—	ns



5.2.2 SWITCHING CHARACTERISTICS OF VDD=5.0V

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
CL2 PULSE CYCLE TIME	t_{WCK}	56	—	ns
CL2 PULSE HIGH LEVEL WIDTH	t_{WCKH}	17	—	ns
CL2 PULSE LOW LEVEL WIDTH	t_{WCKL}	19	—	ns
CL1 PULSE HIGH LEVEL WIDTH	t_{WLPH}	15	—	ns
CL2 RISE TO CL1 RISE TIME	t_{LD}	5	—	ns
CL2 FALL TO CL1 FALL TIME	t_{SL}	25	—	ns
CL1 RISE TO CL2 RISE TIME	t_{LS}	25	—	ns
CL1 FALL TO CL2 FALL TIME	t_{LH}	25	—	ns
CLOCK PULSE RISE/FALL TIME	t_r, t_f	—	50	ns
DATA SETUP TIME	t_{DS}	5	—	ns
DATA HOLD TIME	t_{DH}	15	—	ns
FLM SETUP TIME	t_{FS}	30	—	ns
FLM HOLD TIME	t_{FH}	50	—	ns
DISPOFF LOW LEVEL WIDTH	t_{WDL}	1.2	—	μs
DISPOFF CANCELLATION TIME	t_{SD}	100	—	ns



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6. OPTICAL CHARACTERISTICS

6.1 OPTICAL CHARACTERISTICS OF NORMAL TEMPERATURE MODE

Ta=25°C

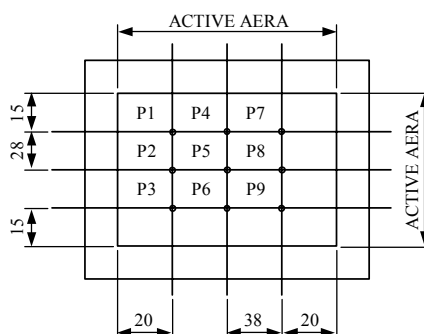
I T E M		SYMBOL	CONDITION		MIN .	TYP .	MAX.	UNIT	REMARK
VIEWING ANGLE RANGE	6 O’CLOCK	θ_{y+}	$K \geq 2$		15	20	—	degree	1
		θ_{y-}			35	40	—		
		θ_{x+}			35	40	—		
		θ_{x-}			35	40	—		
	12 O’CLOCK	θ_{y+}			40	45	—		
		θ_{y-}			25	30	—		
		θ_{x+}			50	55	—		
		θ_{x-}			50	55	—		
CONTRAST RATIO	6 O’CLOCK	K	$\theta_{y-} = 10^{\circ}, \theta_{x} = 0^{\circ}$	35	50	—	—	1	
	12 O’CLOCK		$\theta_{y+} = 10^{\circ}, \theta_{x} = 0^{\circ}$	25	40	—	—		
RESPONSE TIME	RISE	Tr	$\theta_{y} = 0^{\circ}$ $\theta_{x} = 0^{\circ}$	Ta=0°C	—	1700	2550	ms	1
				Ta=25°C	—	350	525		
				Ta=60°C	—	200	260		
	FALL	Tf		Ta=0°C	—	1040	1560		
				Ta=25°C	—	250	375		
				Ta=60°C	—	90	135		
THE BRIGHTNESS OF MODULE		B	IL=5mArms		—	150	—	cd/m ²	2
THE UNIFORMITY OF MODULE		—			70	75	—	%	3

NOTE (1) : PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU – 006B)

NOTE (2) : POLARIZER MODE : TRANSMISSIVE

NOTE (3) : MEASUREMENT OF THE FOLLOWING 9 PLACES ON THE DISPLAY.
DEFINITION OF THE BRIGHTNESS TOLERANCE .



$$\text{UNIFORMITY} : \left[\frac{\text{MINIMUM BRIGHTNESS}}{\text{MAXIMUM BRIGHTNESS}} \right] \times 100\%$$

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6.2 COLOR OF CIE COORDINATE

Ta=25°C

ITEM		SYMBOL	CONDITION	MIN	TYP	MAX	REMARK
COLOR OF CIE COORDINATE	RED	x	$\theta_y = 0^\circ, \theta_x = 0^\circ$	0.52	0.57	0.62	
		y		0.29	0.34	0.39	
	GREEN	x	$\theta_y = 0^\circ, \theta_x = 0^\circ$	0.23	0.28	0.33	
		y		0.49	0.54	0.59	
	BLUE	x	$\theta_y = 0^\circ, \theta_x = 0^\circ$	0.10	0.15	0.20	
		y		0.05	0.10	0.15	
	WHITE	x	$\theta_y = 0^\circ, \theta_x = 0^\circ$	0.25	0.30	0.35	
		y		0.26	0.31	0.36	

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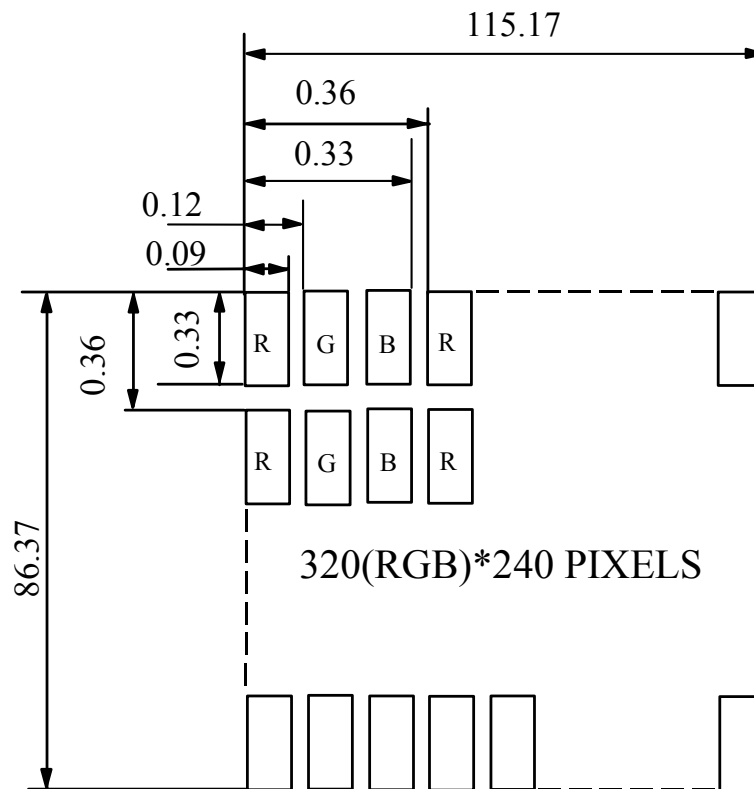
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8. DETAIL DRAWING

8.1 DETAIL DRAWING OF PIXEL MATRIX



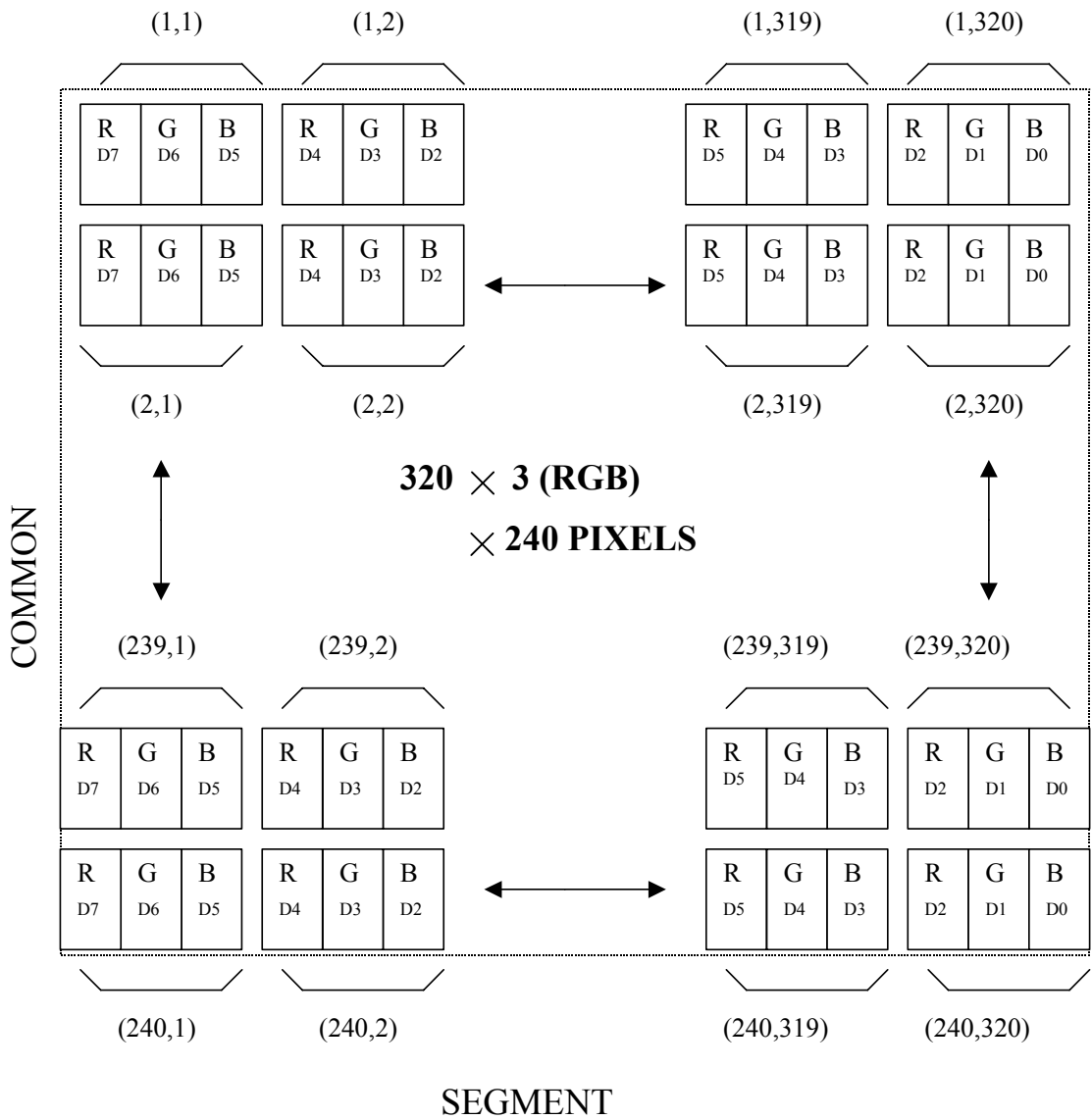
UNIT : mm

SCALE : NTS

NOT SPECIFIED TOLERANCE IS ± 0.1

DOTS MATRIX TOLERANCE IS ± 0.01

8.2 DETAIL DRAWING OF BLOCK DIAGRAM



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10. INTERFACE SIGNALS

IF1 :

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	FLM	H	SYNCHRONOUS SIGNAL FOR DRIVING SCANNING LINE
2	CL1	H→L	DATA SIGNAL LATCH CLOCK(LOAD)
3	CL2	H→L	DATA SIGNAL SHIFT CLOCK(CP)
4	$\overline{\text{DISPOFF}}$	H/L	DISPLAY CONTROL SIGNAL , H:DISPLAY ON L:DISPLAY OFF
5	VDD	—	POWER SUPPLY FOR LOGIC
6	VSS	—	POWER SUPPLY (0V , GND)
7	VCON	—	CONTRAST ADJUSTMENT
8	D0	H/L	DISPLAY DATA
9	D1		
10	D2		
11	D3		
12	D4		
13	D5		
14	D6		
15	D7		
16	VSS	—	GND

IF2 :

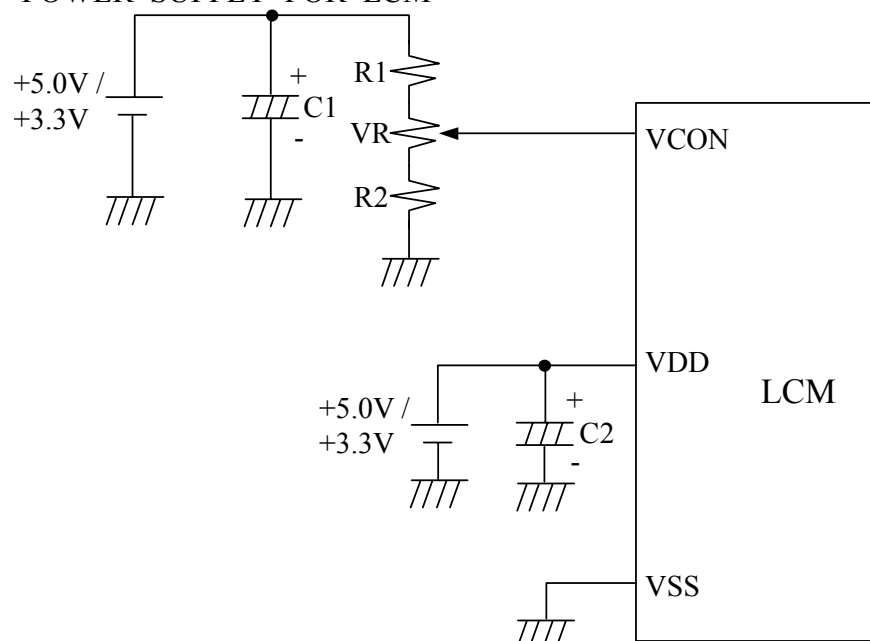
INTERFACE	PIN NO.	SIGNAL	LEVEL	FUNCTION
CCFL	1	HV	AC	POWER SUPPLY FOR CCFL(HOT)
	2~3	NC	—	NON-CONNECTION
	4	GND	—	POWER SUPPLY FOR CCFL(GND)

CN2 : IL-G-4S-S3C2(JAE)

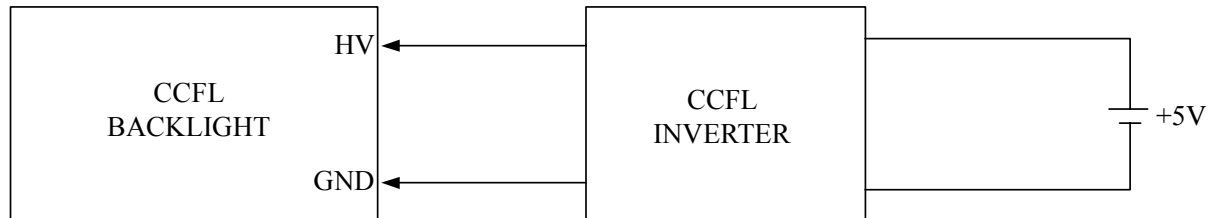
RECOMMENDED MATCHING CONNECTOR : IL-G-4P-S3L2-E(JAE) OR COMPATIBLE

11 . POWER SUPPLY

11.1 POWER SUPPLY FOR LCM

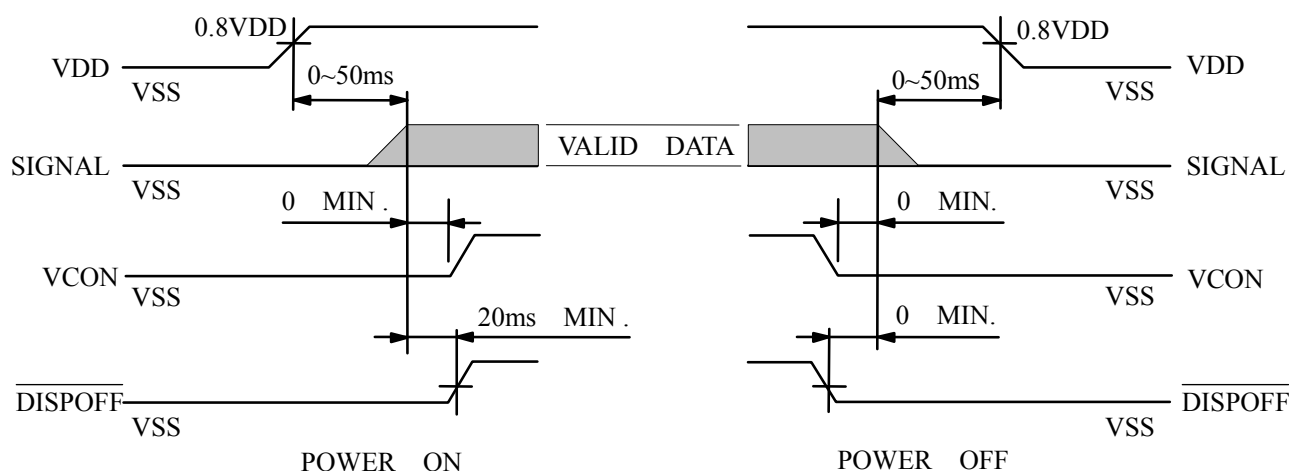


11.2 POWER SUPPLY FOR CCFL BACK-LIGHT



RECOMMENDED CCFL INVERTER : 01-B069-0002

11.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL



The missing pixels may occur when the LCM is driven beyond above power interface timing sequence.