

UNCONTROLLED DOCUMENT

PART NUMBER

LCM-S320240GCN-57H

REV.

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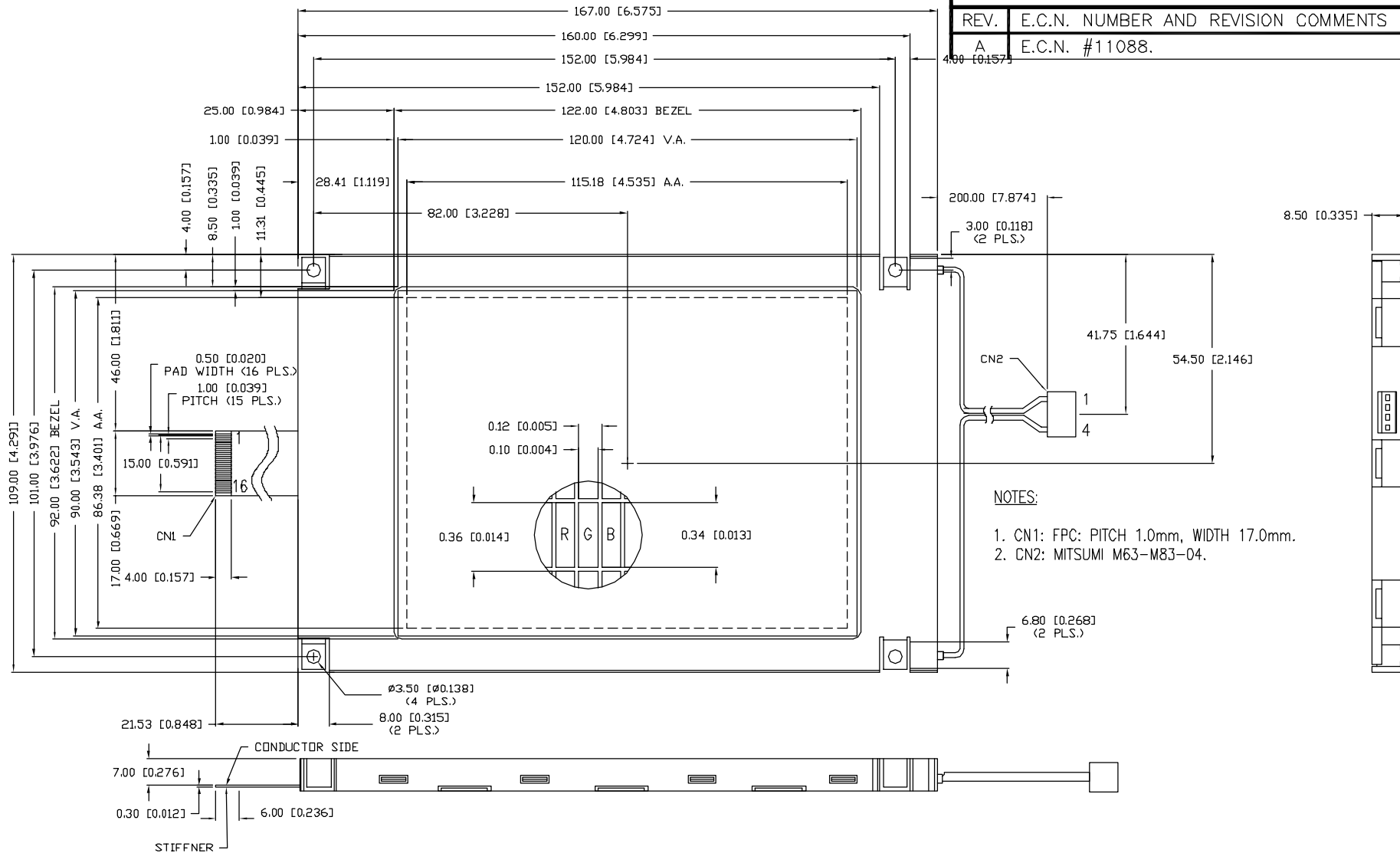
REV. E.C.N. NUMBER AND REVISION COMMENTS

DATE

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E.C.N. #11088.

2.4.04



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RELIABILITY NOTE

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5.7" COLOR STN, 320 x 240 GRAPHIC MODULE,
NEGATIVE, TRANSMISSIVE, CCFL BACKLIGHT, 1/242 DUTY,
6:00 VIEW ANGLE, WEIGHT: 200g.

DRAWN BY:

CT

CHECKED BY:

APPROVED BY:

DATE: 1.14.04

PAGE: 1 OF 6

SCALE: N/A

PIN CONFIGURATION CN1

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	FLM	-	FIRST LINE MARKER
2	CL1	H/L	INPUT DATA LATCH SIGNAL (LOAD)
3	CL2	H/L	DATA SHIFT CLOCK (CP)
4	DISPOFF	-	DISPLAY CONTROL SIGNAL H:ON, L:OFF
5	VDD	-	LOGIC SUPPLY VOLTAGE
6	VSS	-	GND
7	VLCD	-	POWER SUPPLY FOR LCD DRIVER
8	D0	H/L	DISPLAY DATA
9	D1	H/L	DISPLAY DATA
10	D2	H/L	DISPLAY DATA
11	D3	H/L	DISPLAY DATA
12	D4	H/L	DISPLAY DATA
13	D5	H/L	DISPLAY DATA
14	D6	H/L	DISPLAY DATA
15	D7	H/L	DISPLAY DATA
16	VSS	-	GND

INPUT DATA ALLOCATION TABLE

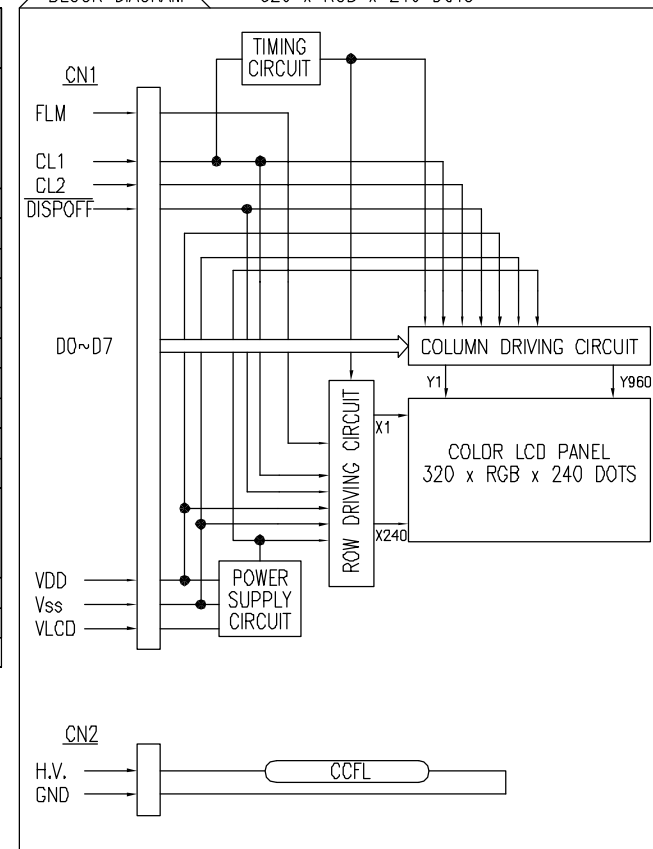
DATA SIGNAL	D7	D6	D5	D4	D3	D2	D1	D0	D7	D6	D5	D4	D3	D2	D1	D0
Y	1	2	3	4	5	6	7	8	9	10	11	12	9	9	9	9
X	1	2	3	4	5	6	7	8	9	10	11	12	5	5	5	5
													6	7	8	9
1	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
2	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
3	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
4	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
5	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
6	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
7	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
8	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
9	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
10	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
238	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
239	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G
240	R	G	B	R	G	B	R	G	B	R	G	B	G	B	R	G

R: RED G: GREEN B: BLUE

PIN CONFIGURATION CN2

PIN NO.	SYMBOL	FUNCTION
1	H.V.	POWER SUPPLY VOLTAGE FOR CCFL
2	-	-
3	-	-
4	GND	CCFL GND

BLOCK DIAGRAM 320 x RGB x 240 DOTS



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5.7" COLOR STN, 320 x 240 GRAPHIC MODULE,
NEGATIVE, TRANSMISSIVE, CCFL BACKLIGHT, 1/242 DUTY,
6:00 VIEW ANGLE, WEIGHT: 200g.

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ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN.	TYP.	MAX.	
SUPPLY VOLTAGE FOR LOGIC	V_{DD}	$V_{DD} - V_{SS}$	4.5	5.0	5.5	V
POWER SUPPLY CURRENT LOGIC	I_{DD}	$V_{DD}=5.0V$	—	1.0	5.0	mA
POWER SUPPLY CURRENT LCD	I_{EE}	$V_{LCD}=22.5V$	—	6.5	13.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	$V_{LCD} - V_{SS}$	DUTY=1/242 BIAS=1/15	$T_a=0^{\circ}C$	(23.6)	—	V
			$T_a=25^{\circ}C$	22.0	22.5	
			$T_a=50^{\circ}C$	(21.4)	—	
INPUT SIGNAL VOLTAGE (NOTE 1)	V_{IH}	"H" LEVEL	$0.8V_{DD}$	—	V_{DD}	V
	V_{IL}	"L" LEVEL	0	—	$0.2V_{DD}$	
FRAME FREQUENCY (NOTE 2)	fFLM	—	115	120	125	Hz
CCFL BACKLIGHT	STARTING VOLTAGE	V_S	$T_a=25^{\circ}C$	850	—	Vrms
	LAMP VOLTAGE	V_L	$T_a=25^{\circ}C$	—	325	Vrms
	FREQUENCY	fL	$T_a=25^{\circ}C$	40	60	KHz
	LAMP CURRENT	I_L	$T_a=25^{\circ}C$	5.0	5.5	mA rms
	BRIGHTNESS	—	—	80	120	cd/m ²
	LIFE HOURS	—	—	10000	20000	HOURS

CAUTION:

1. FLM, CL1, CL2, DISPOFF, D0~D7.
2. MAKE SURE THAT THERE IS NO FLICKER AND RIPPLE PHENOMENON WHEN SETTING THE FRAME FREQUENCY.
3. STARTING DISCHARGE VOLTAGE IS INCREASED WHEN LCM IS OPERATING AT LOW TEMPERATURES.
4. AVERAGE LIFE TIME OF CCFL WILL BE DECREASED WHEN LCM IS OPERATED AT LOW TEMPERATURES.

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE		UNIT
			MIN	MAX	
SUPPLY VOLTAGE FOR LOGIC	$V_{DD} - V_{SS}$	$T_a=25^{\circ}C$	-0.3	7.0	V
POWER SUPPLY FOR LCD DRIVER	$V_{LCD} - V_{SS}$	$T_a=25^{\circ}C$	0.0	45.0	V
INPUT VOLTAGE	V_I	$T_a=25^{\circ}C$	-0.3	$V_{DD}+0.3$	V
OPERATING TEMPERATURE*	T_{opr}	—	0	+50	$^{\circ}C$
STORAGE TEMPERATURE	T_{stg}	—	-20	+60	$^{\circ}C$

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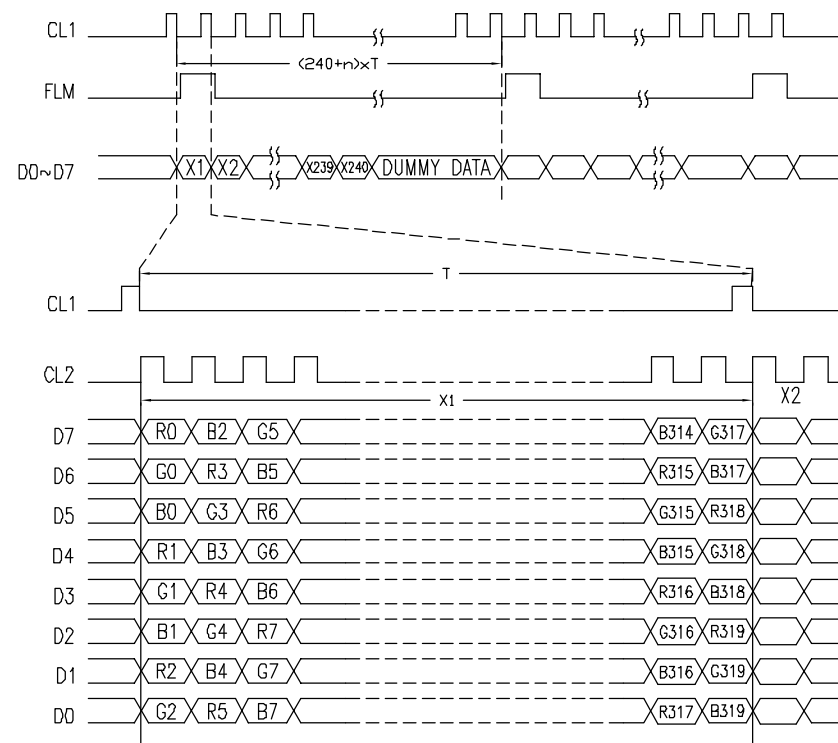
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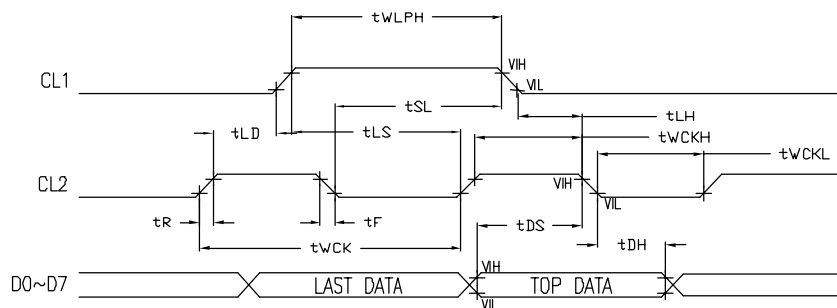
SEE PAGE 1.

INTERFACE TIMING CHART

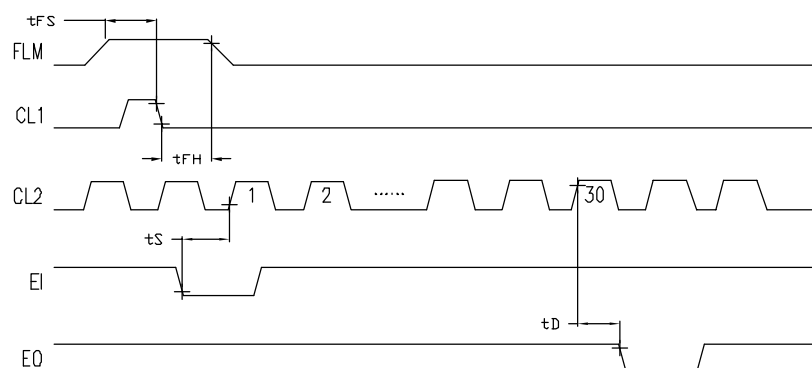


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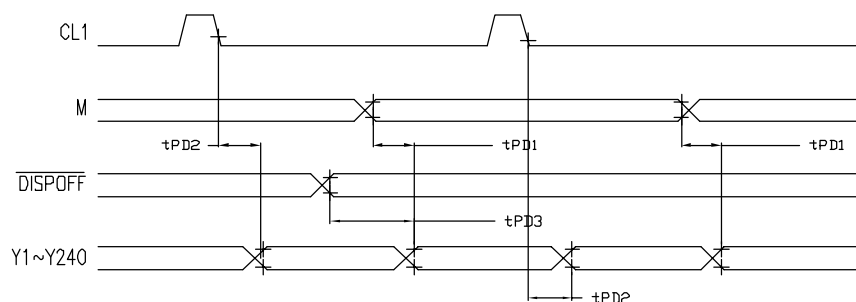
INPUT TIMING CHARACTERISTIC



INPUT/OUTPUT TIMING CHARACTERISTIC



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6:00 VIEW ANGLE, WEIGHT: 200g.

AC CHARACTERISTICS

(VDD = 3.0~4.5V, VSS = 0V, Ta = 0°C~+50°C)

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN.	TYP.	MAX.	
SHIFT CLOCK PERIOD	t_{WCK}	—	66	—	—	ns
SHIFT CLOCK "H" PULSE WIDTH	t_{WCKH}	—	23	—	—	ns
SHIFT CLOCK "L" PULSE WIDTH	t_{WCKL}	—	23	—	—	ns
DATA SETUP TIME	t_{DS}	—	10	—	—	ns
DATA HOLD TIME	t_{DH}	—	25	—	—	ns
LATCH PULSE "H" PULSE WIDTH	t_{WLPH}	—	30	—	—	ns
SHIFT CLOCK RISE TO LATCH PULSE RISE TIME	t_{LD}	—	10	—	—	ns
SHIFT CLOCK FALL TO LATCH PULSE FALL TIME	t_{SL}	—	30	—	—	ns
LATCH PULSE RISE TO SHIFT CLOCK RISE TIME	t_{LS}	—	30	—	—	ns
LATCH PULSE FALL TO SHIFT CLOCK FALL TIME	t_{LH}	—	30	—	—	ns
ENABLE SETUP TIME	t_S	—	12	—	—	ns
INPUT SIGNAL RISE TIME	t_R	—	—	—	50	ns
INPUT SIGNAL FALL TIME	t_F	—	—	—	50	ns
OUTPUT DELAY TIME(1)	t_D	—	—	—	44	ns
OUTPUT DELAY TIME(2)	t_{PD1}	—	—	—	1.2	ns
OUTPUT DELAY TIME(3)	t_{PD2}	—	—	—	1.2	ns
OUTPUT DELAY TIME(4)	t_{PD3}	—	—	—	1.2	ns
FLM SETUP TIME	t_{FS}	—	30	—	—	ns
FLM HOLD TIME	t_{FH}	—	50	—	—	ns

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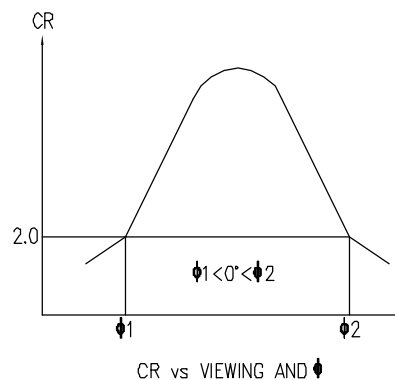
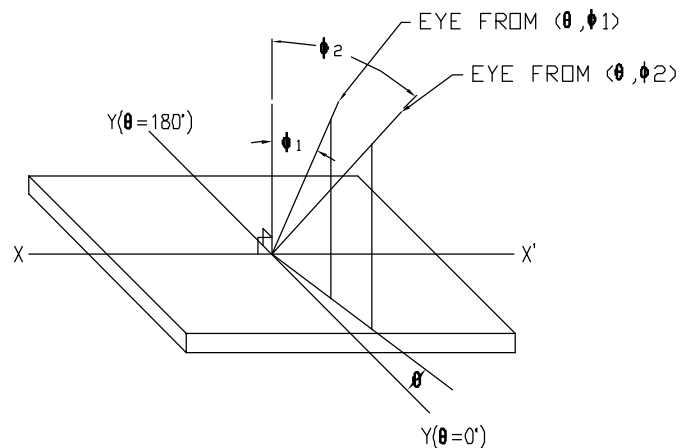
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OPTICAL CHARACTERISTICS		T _a =25°C (BACKLIGHT ON)					
ITEM		SYMBOL	CONDITION	STANDARD VALUE			UNIT
				MIN.	TYP.	MAX.	
VIEWING ANGLE RANGE		φ1,φ2	θ=0° CR≥2	—	40	—	DEG.
CONTRAST RATIO		CR	θ=0°, φ=0°	—	40	—	—
CHROMATICITY COORDINATES		R	X	0.44	0.49	0.54	—
			Y	0.30	0.35	0.40	—
		G	X	0.28	0.33	0.38	—
			Y	0.44	0.49	0.54	—
		B	X	0.15	0.20	0.25	—
			Y	0.16	0.21	0.26	—
		W	X	0.27	0.32	0.37	—
			Y	0.30	0.35	0.40	—
RESPONSE TIME	RISE: NOTE 1	T _r	θ=0°, φ=0°	—	250	—	ms
	FALL: NOTE 2	T _f		—	200	—	

NOTES:

1. THE TIME THAT THE LUMINANCE LEVEL REACHES 90% OF FULL BRIGHTNESS LEVEL FROM 0% WHEN "ON" SIGNAL IS APPLIED.
2. THE TIME THAT THE LUMINANCE LEVEL REACHES 10% OF FULL BRIGHTNESS LEVEL FROM 100% WHEN "OFF" SIGNAL IS APPLIED.



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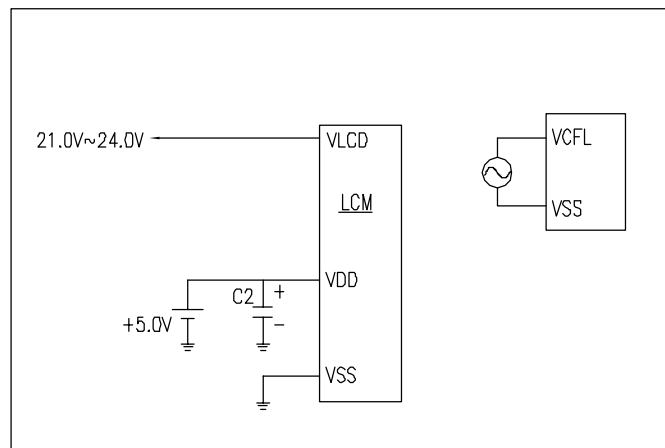
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POWER SUPPLY FOR LCM

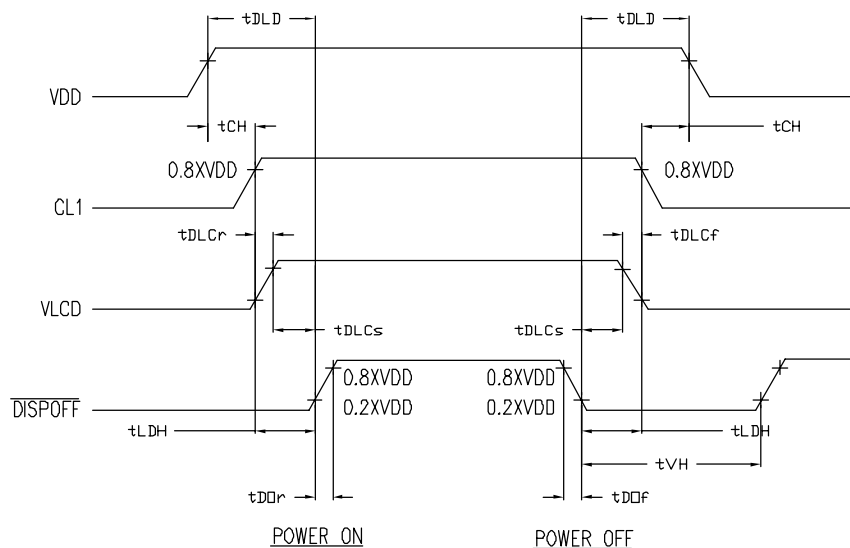


POWER SUPPLY SEQUENCE

SYMBOL	MIN.	MAX.	UNIT
t_{DLD}	200	—	ms
t_{CH}	0	—	ms
t_{LDH}	20	—	ms
t_{DOr}	—	100	ns
t_{DOF}	—	100	ns
t_{DLCr}	0	—	ms
t_{DLCf}	0	—	ms
t_{DLCs}	20	—	ms
t_{VH}	200	—	ms

WARNING:

1. POWER ON/OFF SHOULD BE PERFORMED USING DISPOFF FUNCTION.
2. INCORRECT POWER SUPPLY SIGNAL SEQUENCE MAY CAUSE PERMANENT DAMAGE TO THE LCD.



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