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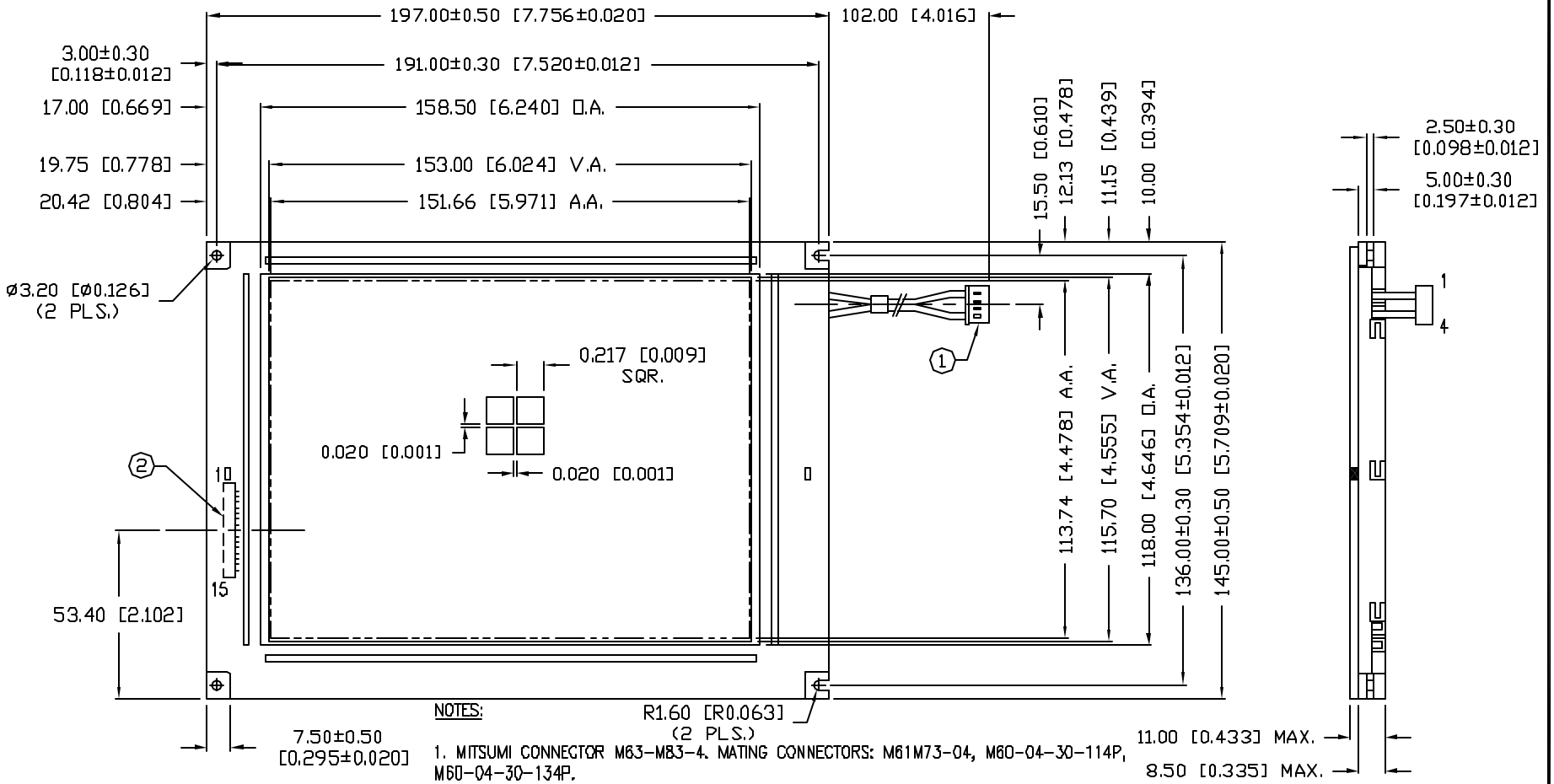
PART NUMBER	REV.
LCM-S640480GWN-C	A

REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
A	E.C.N. #11195.	12.09.04



NOTES:

1. MITSUMI CONNECTOR M63-M83-4. MATING CONNECTORS: M61M73-04, M60-04-30-114P, M60-04-30-134P.
2. SUMITOMO 1.0mm PITCH FFC CABLE. MATING CONNECTOR: 6224-015-001-008 (ELCD).

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VGA 640 x 480 GRAHPIC LCD MODULE, BLACK & WHITE, FSTN, TRANSMISSIVE NEGATIVE IMAGE, 1/240 DUTY, DUAL SCAN, CCFL BACKLIGHT.

RELIABILITY NOTE

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290 E. HELEN ROAD
PALATINE, IL 60067-6976
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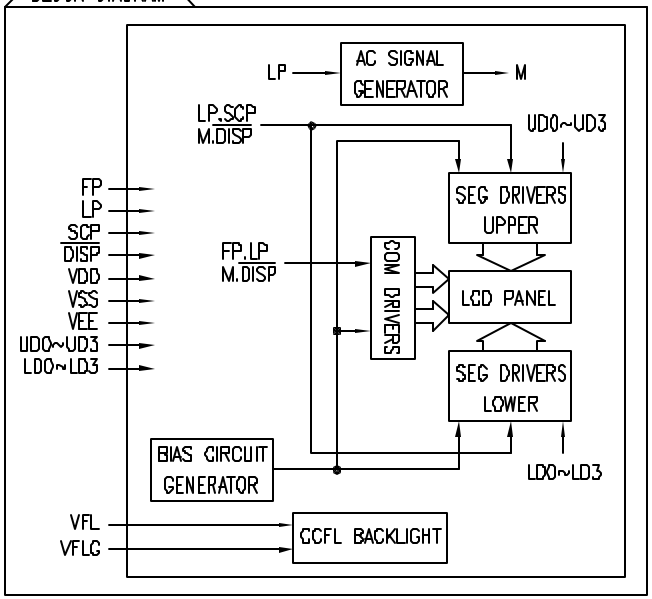
PIN CONFIGURATION FFC CABLE

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	FP	–	FRAME PULSE
2	LP	–	LATCH PULSE IN ONE LINE
3	SCP	–	SHIFT CLOCK PULSE FOR X-DRIVERS
4	$\overline{DISP}$	L	SEQUENCE SIGNAL OF POWER SUPPLY (L:OFF)
5	VDD	+5V	POWER SUPPLY FOR LOGIC (+5V)
6	VSS	–	GROUND
7	VEE	–	POWER SUPPLY FOR CONTRAST CONTROL
8~11	UD0~3	H/L	DATA INPUT FOR UPPER HALF OF THE SCREEN
12~15	LD0~3	H/L	DATA INPUT FOR LOWER HALF OF THE SCREEN

PIN CONFIGURATION CCFL CONNECTOR MITSUMI

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	VFL	–	POWER SUPPLY FOR CCFL (HOT)
2	NC	–	NO CONNECTION
3	NC	–	NO CONNECTION
4	VFLG	–	POWER SUPPLY FOR CCFL (GROUND)

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

T_A=25°C

ITEM		SYMBOL	CONDITION	STANDARD VALUE MIN.	TYP.	MAX.	UNIT
SUPPLY VOLTAGE FOR LOGIC		V_{DD} -Vss	–	2.7	4.5	5.5	V
POWER SUPPLY CURRENT (BACKLIGHT OFF)		I_{DD}	V_{DD}=4.5V, V_{DD}-V_O=21.2V, FLM=64Hz	–	3.0	10.0	mA
		I_{EE}		–	6.0	20.0	mA
INPUT VOLTAGE	HIGH	V_{IH}	–	2.2	–	V_{DD}	V
	LOW	V_{IL}	–	0	–	0.6	V
RECOMMENDED MODULE DRIVING VOLTAGE		V_{EE} -Vss	T_A=0°C	22.5	23.5	24.5	V
			T_A=25°C	21.0	22.0	23.0	V
			T_A=50°C	19.5	20.5	21.5	V
CCFL BACKLIGHT	STARTING VOLTAGE	V_{FLS}	–	–	750	–	Vrms
	DRIVING VOLTAGE	V_{FLD}	–	–	360	–	Vrms
	DRIVING FREQUENCY	f_{FL}	V_{FLD}=450Vrms	15	30	85	kHz
	DRIVING CURRENT	I_{FLD}	V_{FLD}=450Vrms, f_{FL}=30kHz	–	5.0	–	mA
	SATURATION TIME	t_{SAT}	–	–	1	–	minute

NOTES:

1. BUILT IN M-CLOCK GENERATING CIRCUIT ON BOARD. USER DOES NOT HAVE TO SUPPLY M-CLOCK.

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE MIN	MAX	UNIT
SUPPLY VOLTAGE FOR LOGIC	V_{DD} -Vss	Ta=25°C	-0.3	7.0	V
SUPPLY VOLTAGE FOR LCD DRIVE	V_{EE} -Vss	–	0	30.0	V
INPUT VOLTAGE	V_{IN}	Ta=25°C	-0.3	V_{DD}	V
OPERATING TEMPERATURE	Topr	–	0	50	°C
STORAGE TEMPERATURE	Tstg	–	-20	70	°C

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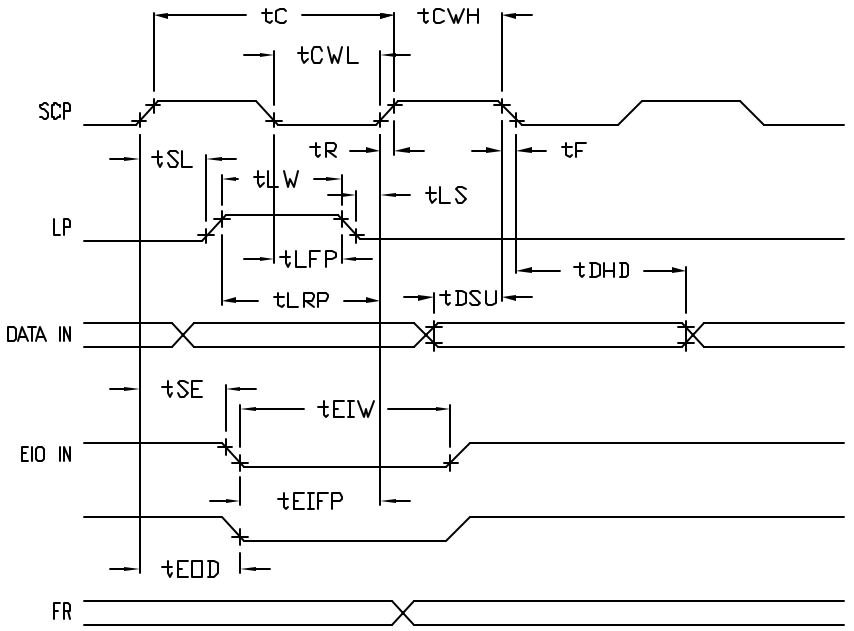
AC CHARACTERISTICS

(VDD = 2.5~4.5V, VEE = +15.0~24.0V, Ta = 0°C~50°C)

ITEM	SYMBOL	CONDITION	STANDARD VALUE		UNIT
			MIN.	MAX.	
CLOCK CYCLE	t_C	–	125	–	ns
SCP PULSE WIDTH	t_{CWH},t_{CWL}	–	50	–	ns
DATA SET-UP TIME	t_{DSU}	–	50	–	ns
DATA HOLD TIME	t_{DHD}	–	50	–	ns
SCP RISE/FALL TIME	t_R,t_F	–	–	(*5)	ns
LP RISE TIME	t_{LRP}	–	50	–	ns
LP FALL TIME	t_{LFP}	–	50	–	ns
LP PULSE WIDTH	t_{LW}	–	45	–	ns
SCP TO LP DELAY TIME	t_{SL}	–	40	–	ns
LP TO SCP DELAY TIME	t_{LS}	–	40	–	ns
EIO-IN FALL TIME	t_{EIFP}	–	40	–	ns
EIO-IN PULSE WIDTH	t_{EIW}	–	40	–	ns
SCP TO EIO DELAY TIME	t_{SE}	–	20	–	ns
EIO-OUT DELAY TIME	t_{EOD}	–	–	80	ns

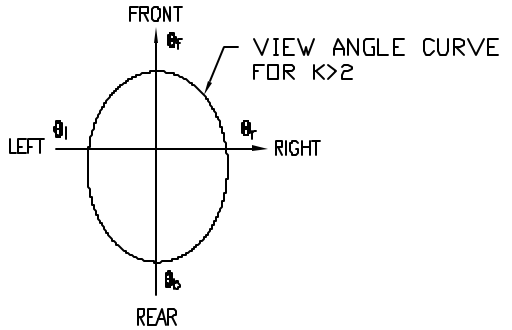


OPTICAL CHARACTERISTICS

T_A=25°C

ITEM	SYMBOL	STANDARD VALUE			UNIT
		MIN.	TYP.	MAX.	
CONTRAST	K	12	16.5	–	–
RESPONSE TIME	t_R	–	150	–	ms
	t_F	–	220	–	
VIEWING ANGLE RANGE	θ_f	–	45	37	deg
	θ_b	–	45	22	
	θ_r	–	20	50	
	θ_l	–	33	50	
FRAME FREQUENCY	Fr	–	70	–	Hz
CHROMATICITY COORDINATES	x	–	0.31	–	–
	y	–	0.34	–	
LUMINANCE	L	100	120	–	cd/m²

DEFINITION OF VIEWING DIRECTION



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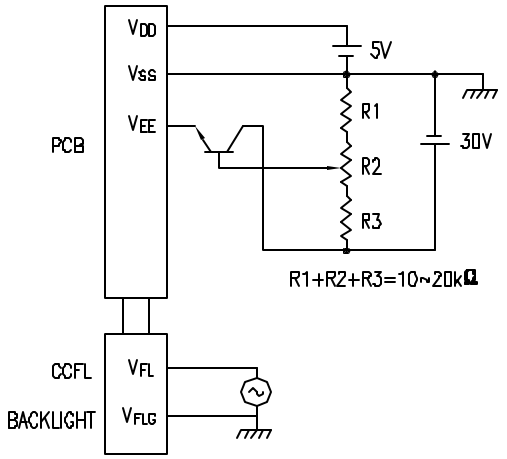
DISPLAY PATTERN

	SEG1	SEG2	SEG3	SEG4	----	SEG637	SEG638	639	640
COM1	UD3	UD2	UD1	UD0	----	UD3	UD2	UD1	UD0
COM2	UD3	UD2	UD1	UD0	----	UD3	UD2	UD1	UD0
COM239	UD3	UD2	UD1	UD0	----	UD3	UD2	UD1	UD0
COM240	UD3	UD2	UD1	UD0	----	UD3	UD2	UD1	UD0
COM1	LD3	LD2	LD1	LD0	----	LD3	LD2	LD1	LD0
COM2	LD3	LD2	LD1	LD0	----	LD3	LD2	LD1	LD0
COM239	LD3	LD2	LD1	LD0	----	LD3	LD2	LD1	LD0
COM240	LD3	LD2	LD1	LD0	----	LD3	LD2	LD1	LD0

POWER SUPPLY



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