

LMG640X FAMILY

- 240 dot (W) x 128 dot (H) graphic and alphanumeric display
- Controller HD61330B built-in
- Colour Tone:
 LMG6400PLGR - blue on grey
 LMG6401PLGE - blue on grey with EL Backlight
 LMG6402PLFR - reflective film B/W type

MECHANICAL DATA (Nominal Dimensions)

Module size	159W x 101H x 9.5D (max) mm
Effective display area	126W x 71H mm
Dot size	0.47W x 0.47H mm
Dot pitch	0.5W x 0.5H mm
Viewing direction	6 o'clock
Weight	about 160g
Duty	1 / 128

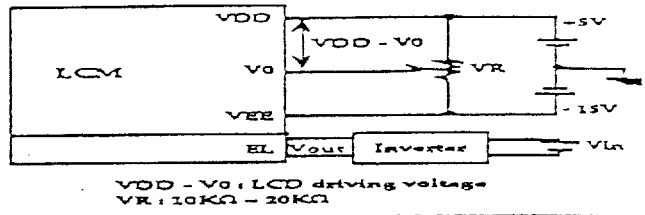
ABSOLUTE MAXIMUM RATINGS

	min	max
Power supply for logic (VDD - VSS)	0	7.0 V
Power supply for LCD drive (VDD - VSS)	0	22.0 V
Input Voltage (Vi)	VSS	VDD V
Operating temperature (Ta)	0	40°C
Storage temperature (Tstg)	-20	60°C

Pin Assignment

PIN NO.	SYMBOL	FUNCTION
A1	VSS (0V)	Ground
A2	VDD (+5V)	Power supply for logic
A3	V0	Power supply for LCD drive
A4	RS	Register select
A5	R / W	Read / write
A6	E	Enable
A7 - A14	DB0 - DB7	Data bus
A15	\overline{CS}	Chip select
A16	\overline{RES}	Reset
A17	VEE (-15.0V)	Power supply for LCD drive
A18 - A20	N.C.	No connection
E	VEL	Power supply for EL drive
E	VEL	Power supply for EL drive

Power Supply

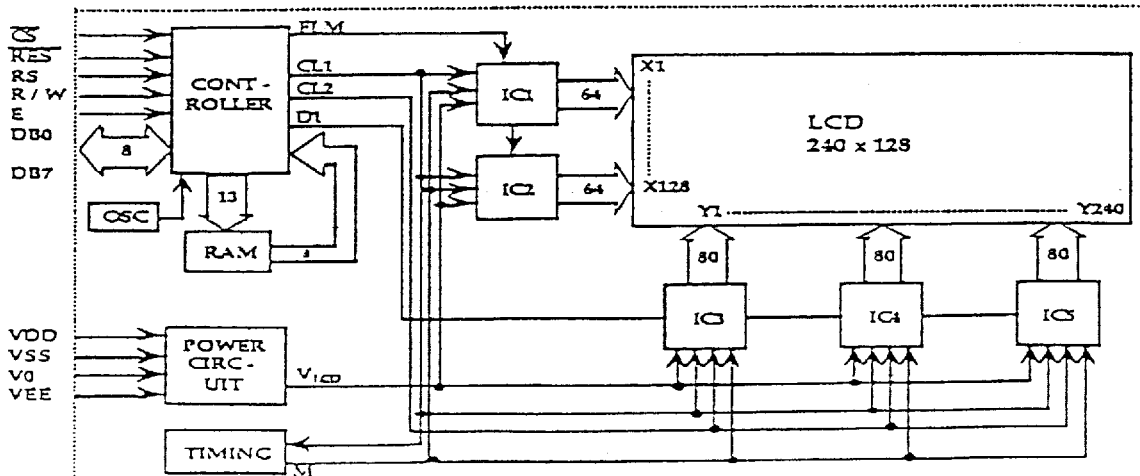


Electrical Characteristics

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Logic circuit power supply voltage	VDD - VSS	—	4.75	5.0	5.25	V
LC driver circuit power supply voltage	VEE - VSS	—	-14.5	-15.0	-15.5	V
Input voltage	Vi	H Level	0.8VDD	-	VDD	V
		L Level	0	-	0.2VDD	V
Power supply current Note 1	IDD	VDD - VSS = 5.0V VDD - V0 = 15.8V	-	6	-	mA
	IEE	VDD - VSS = 5.0V VDD - V0 = 15.8V	-	4	-	mA
Recommended LC driving voltage Note 2	VDD - V0	1 / 128 Ta = 0°C	-	15.9	-	V
		Duty Ta = 25°C	-	15.3	-	V
		φ = 10° Ta = 10°C	-	15.4	-	V
Frame frequency	fFLM	FEL = 400Hz	-	75	-	Hz
EL power supply Note 3	VEL	FEL = 400Hz	-	100	-	Vrms
	IEL	VEL = 100Vrms FEL = 400Hz	-	-	160	mA rms

Note 1: fFLM = 75.0Hz VDD - V0 = 15.8V D = GND (VSS)
 Note 2: Recommended LC driving voltage may fluctuate about ±0.5V by each module
 Note 3: Recommended EL inverter: Pacal type - P4

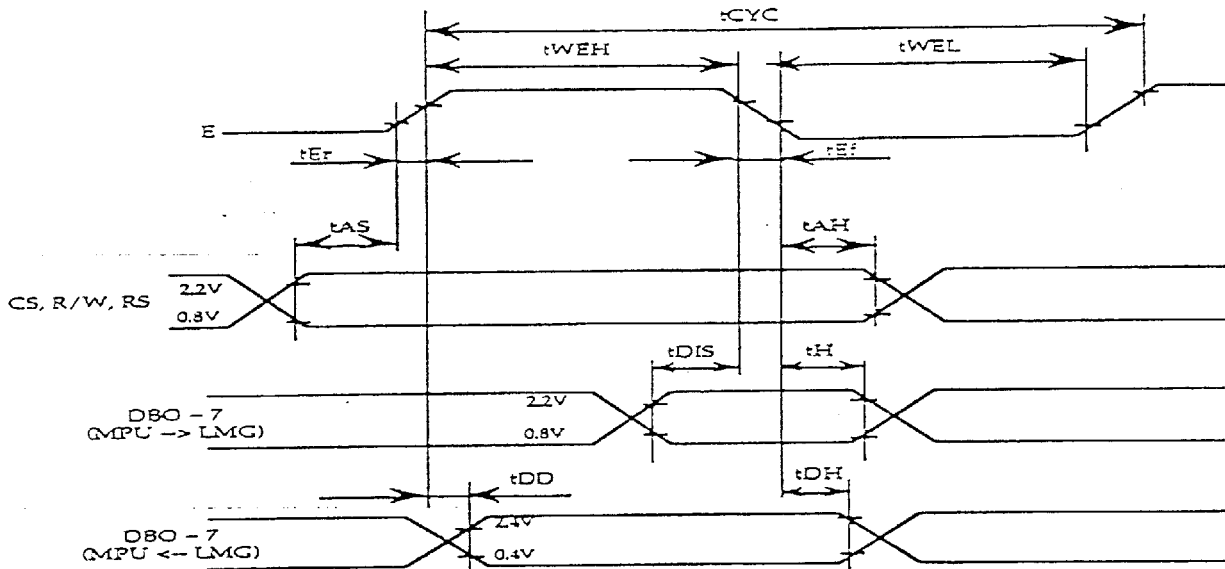
Block Diagram



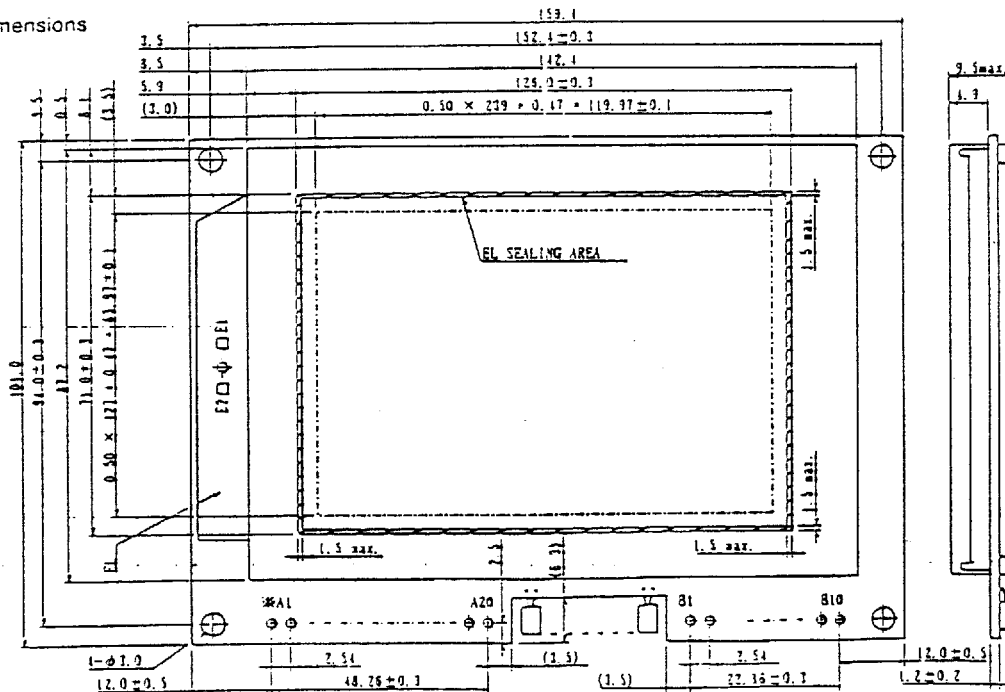
Interface Timing

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Enable Cycle Time	t _{CYC}	1.0	-	-	μS
Enable Pulse Width	H Level	0.45	-	-	μS
	L Level	0.45	-	-	μS
Enable Rise Time	t _{Er}	-	-	25	nS
Enable Fall Time	t _{Ef}	-	-	25	nS
CS, R/W, RS Set Up Time	t _{AS}	140	-	-	nS
Data Set Up Time	t _{DIS}	225	-	-	nS
Data Delay Time	t _{DD}	-	-	225	nS
Data Hold Time	t _H	10	-	-	nS
CS, R/W, RS → Hold Time	t _{AH}	10	-	-	nS
Data Hold Time	t _{DH}	20	-	-	nS

Interface Timing (MPU ↔ LMG)



External Dimensions



Unit : mm
 Scale : NTS
 Measurement tolerance : ±0.3

※B1-B10 pads should not be used.
 Do not connect any signals to these pads.
 Use pin A1-A20 for interface.

