

LM300XM

T-41-39

- 240 dot (W) x 64 dot (H) graphic and alpha-numeric display
- Attachable controller LSI: HD61830

MECHANICAL DATA (Nominal dimensions)

Module size	180W x 75H x 13.8T (max.) mm
Effective display area	132W x 39H mm
Number of dots	240W x 64H dot
Dot size	0.48W x 0.48H mm
Dot pitch	0.53W x 0.53H mm
Weight	about 150g

ABSOLUTE MAXIMUM RATINGS

	min.	max.
Power supply for logic ($V_{DD} - V_{SS}$)	0	7.0V
Power supply for LCD drive ($V_{DD} - V_{EE}$)	0	22.0V
Input voltage (V_I)	V_{SS}	V_{DD}
Operating temperature (T_a)	0	40°C
Storage temperature (T_{stg})	-20	60°C

ELECTRICAL CHARACTERISTICS

$T_a=25^{\circ}\text{C}$, $V_{DD}=5.0\text{V}\pm 0.25\text{V}$, $V_{EE}=-9.0\text{V}\pm 0.25\text{V}$

Input "high" voltage (V_{IH}) $0.7 \times V_{DD}$ V min.

Input "low" voltage (V_{IL}) $0.3 \times V_{DD} V_{max}$.

Clock frequency (f_{CL2}) 390 kHz min.

460 kHz typ.

520 kHz max.

Power supply current (I_{DD}) 5mA typ.

(IEE) 3mA typ.

($D_1, D_2 = \text{GND}, f_{C1,2} = 460 \text{ kHz}$)

Power supply for LCD drive (Recommended) ($V_O - V_{EE}$)

Duty = 1/32

Ta= 0°C 12.0 V typ.

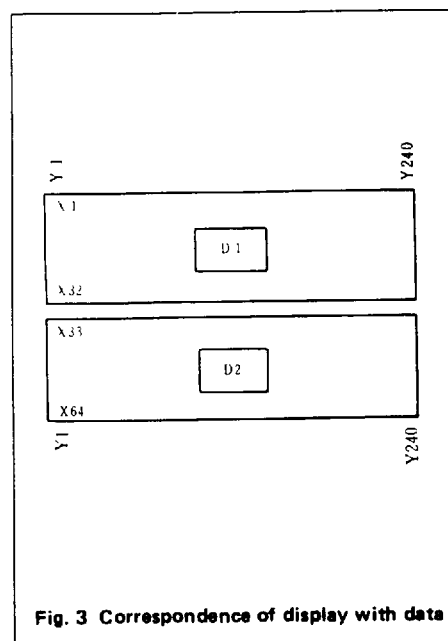
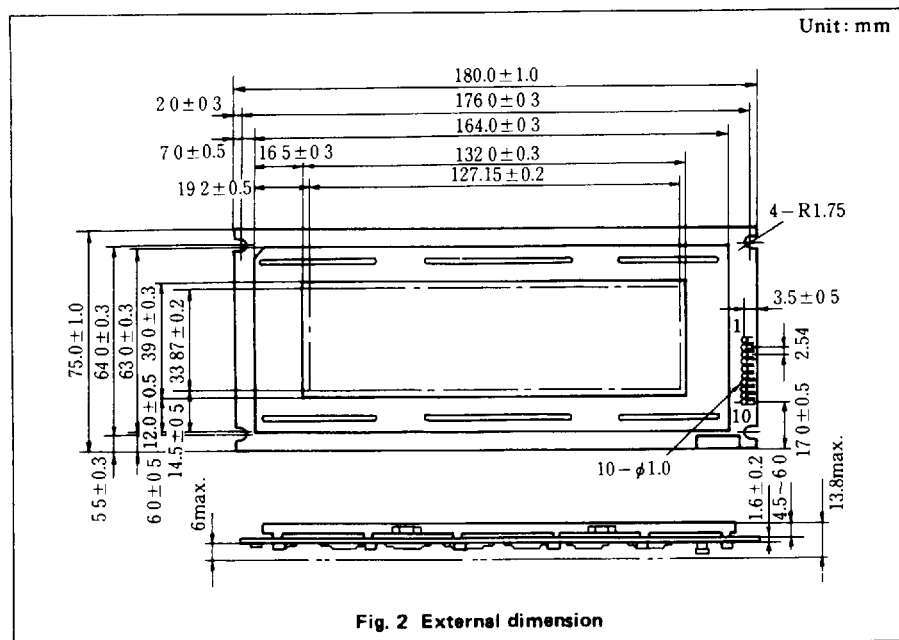
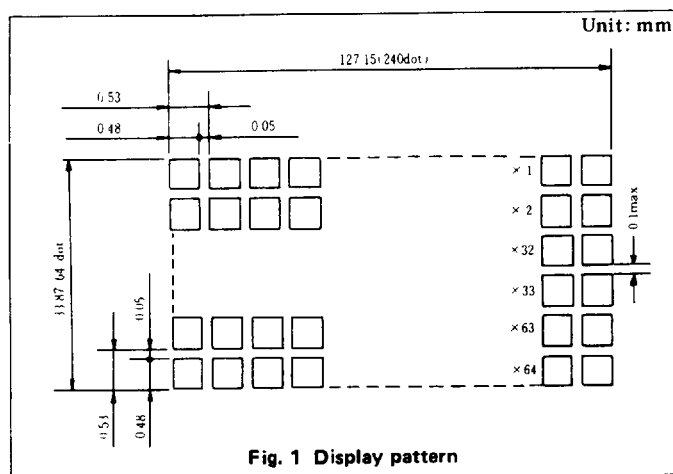
T_a=25°C 11.4 V typ.

Ta=40°C 11.0 V typ.

OPTICAL DATA See page 5

INTERNAL PIN CONNECTION

Pin No.	Symbol	Level	Function
1	D1	H/L	Serial row data
2	FLM	H	The FLM signal indicates the beginning of each display cycle.
3	M	H/L	Control signal for a.c. driving
4	CL1	H→L	The CL1 latches the serial data in the shift registers.
5	CL2	H→L	Clock signal for shifting the serial data
6	D2	H/L	Serial row data
7	$V_{DD}(+5V)$	—	Power supply for logic circuit
8	$V_{SS}(GND)$	—	Ground
9	$V_{EE}(-9V)$	—	Power supply for LC driving
10	V_O	—	Operating voltage for LC driving



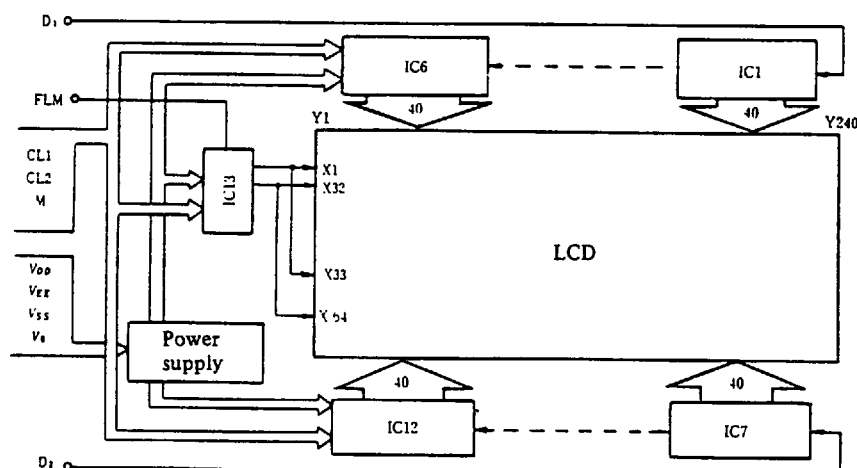


Fig. 4 Block diagram

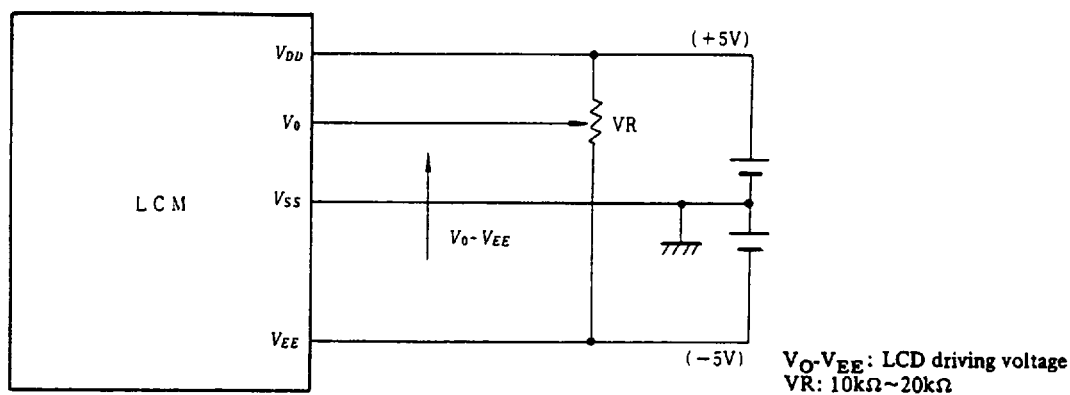


Fig. 5 Power supply

TIMING CHARACTERISTICS

Item	Symbol	Min.	Typ.	Max.	Unit
Clock frequency	f_{CL2}	—	—	540	kHz (Note 1)
Clock pulse width (High level)	t_{CWH}	120	—	—	ns
Clock pulse width (Low level)	t_{CWL}	120	—	—	ns
Clock set up time	t_{CSU}	100	—	—	ns
Data set up time	t_{SU}	100	—	—	ns
FLM set up time	t_{FSU}	300	—	—	ns
FLM hold time	t_{FH}	100	—	—	ns
Data hold time	t_{DH}	100	—	—	ns

Notes 1. Optimum frequency for the highest contrast depends on the type of module.

2. In adjusting FLM frequency, avoid setting it around the commercial frequency (50 Hz $\pm$ 2 Hz or 60 Hz $\pm$ 2 Hz) to prevent LCD flicker.

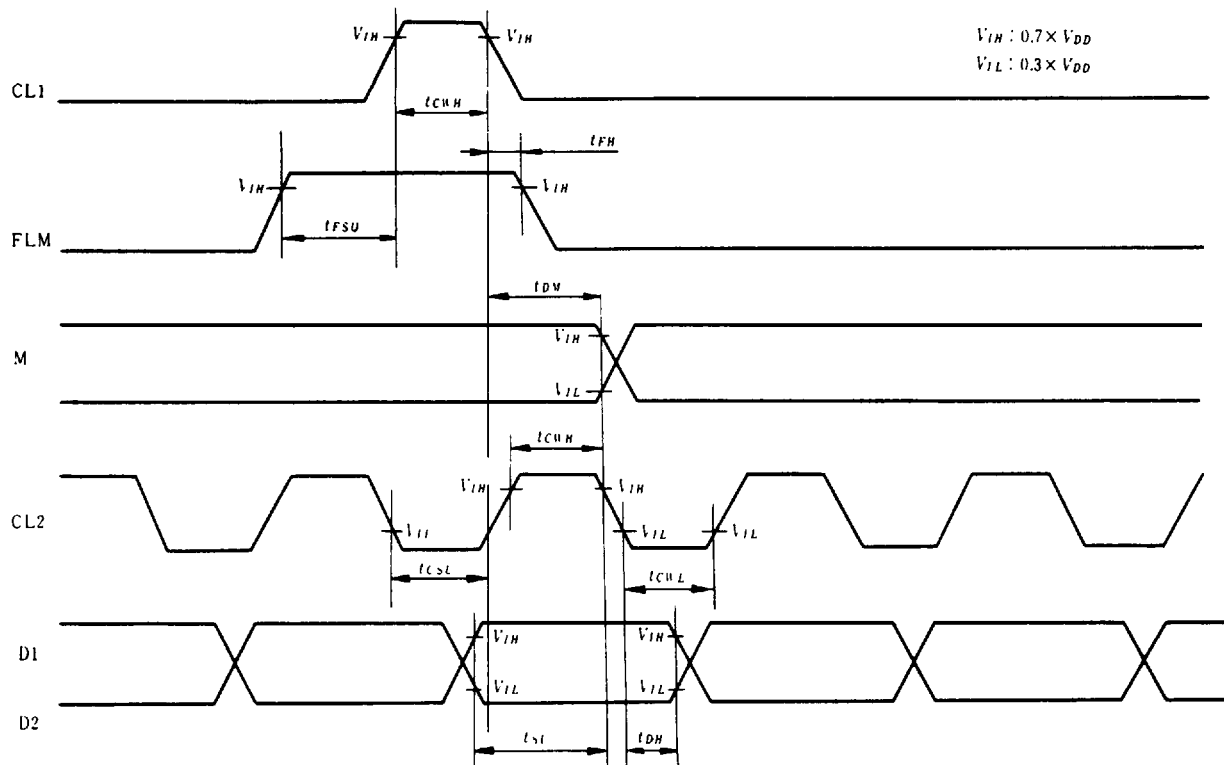


Fig. 6 Interface timing (data write)

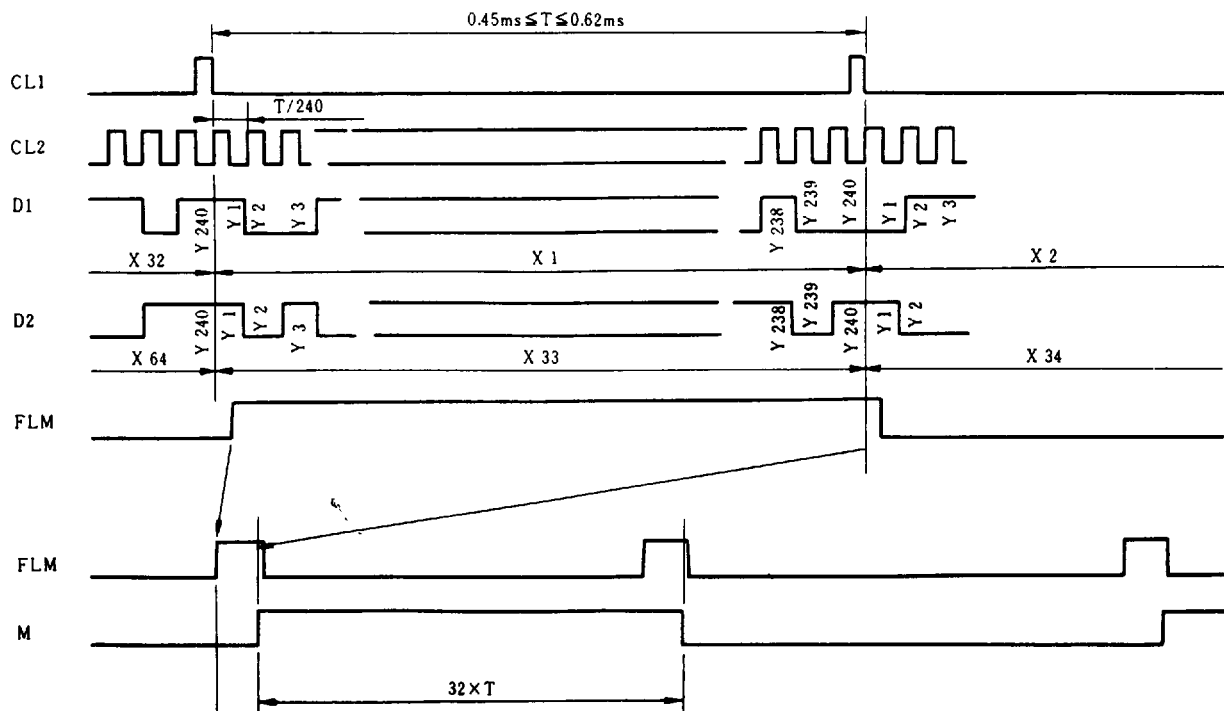


Fig. 7 Interface timing