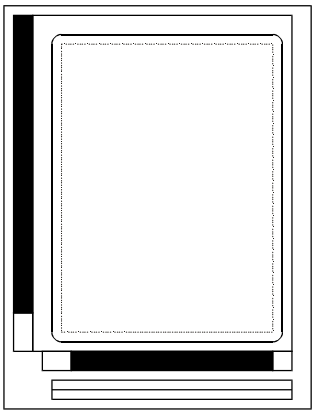
HANTRONIX

PRODUCT SPECIFICATION

HDM128GS16-2

128x160 GRAPHICS
LCD DISPLAY MODULE



HANTRONIX, INC. 10080 BUBB RD. CUPERTINO, CA 95014	**Q.A.:** JB	**REV.:** 1.0	HDM128GS16-2	SHEET 1 OF 11 **DATE:** 9/8/98

MECHANICAL DATA

(1) Part Name	LMA68_059_____
(2) Module Size	66.8 (W)mm x 86.8 (H)mm x MAX 5.0 (D)mm (W/O B.L.)
(3) Dot Size	0.36 (W)mm x 0.36 (H)mm
(4) Dot Pitch	0.395 (W)mm x 0.395 (H)mm
(5) Number of Dots	128 (W) x 160 (H)Dots
(6) Duty	1/128
(7) LCD DISPLAY MODE	STN: ☐ GRAY ☐ YELLOW
	FSTN: ☐ Black and White(Normal White/Positive Image)
Rear Polarizer:	☐ Reflective ☐ Transflective
(8)Viewing direction	☐ 6 O'clock ☐ 12 O'clock ☐ _____ O'clock
(9)Backlight	☐ W/O
(10)Weight	W/O B.L.: 31.8 g

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ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

Vss=0 V: Standard

ITEM	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VCC-VSS	-0.3	7.0	V	
Input Voltage	VCC-V5	0	24.0	V	
Static Electricity	-	-	-	-	Note 1

Note 1 LCM should be grounded during handling LCM.

(2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	0	50	-20	70	Note 2 , 3
Humidity	Note 1		Note 1		Without condensation

Note 1 Ta ≦ 50°C : 85%RH max
Ta > 50°C : Absolute humidity must be lower than the humidity of 85%RH at 50°C

Note 2 Ta at -20°C will be < 48hrs, at 70°C will be < 120 hrs

Note 3 Background color changes slightly depending on ambient temperature. This phenomenon is reversible.

ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
Logic Circuit Power Supply	VCC–VSS	–		4.75	5.0	5.25	V
LCD Driver Power Supply	VCC–V5	1/12Bias	0°C	18.4	19.4	20.4	V
			25°C	17.2	18.2	19.2	V
			50°C	15.4	16.7	–	V
Input Voltage	VIH	H level		0.8VCC	–	VCC	V
	VIL	L level		GND	–	0.2VCC	V
Supply Current for Logic	ICC	VCC = 5.0V		–	3.0	–	mA
Supply Current for LCD	ILCD	VCC –V5=18.2V		–	2.5	–	mA

OPTICAL CHARACTERISTICS

AT V_{OP}

ITEM / MODE		Cr(Contrast Ratio) 25℃ MIN.	Cr(Contrast Ratio) 25℃ TYP.	θ(Viewing Angle) 25℃ MIN.	θ(Viewing Angle) 25℃ TYP.	φ(Viewing Angle) 25℃ MIN.	φ(Viewing Angle) 25℃ TYP.
R	A	—	—	—	—	—	—
	C	3.5	7	40	60	20	28
	J	4	8	35	60	20	35
S	A	—	—	—	—	—	—
	C	3	6	35	50	20	25
	J	—	—	—	—	—	—
note		NOTE6		NOTE5			

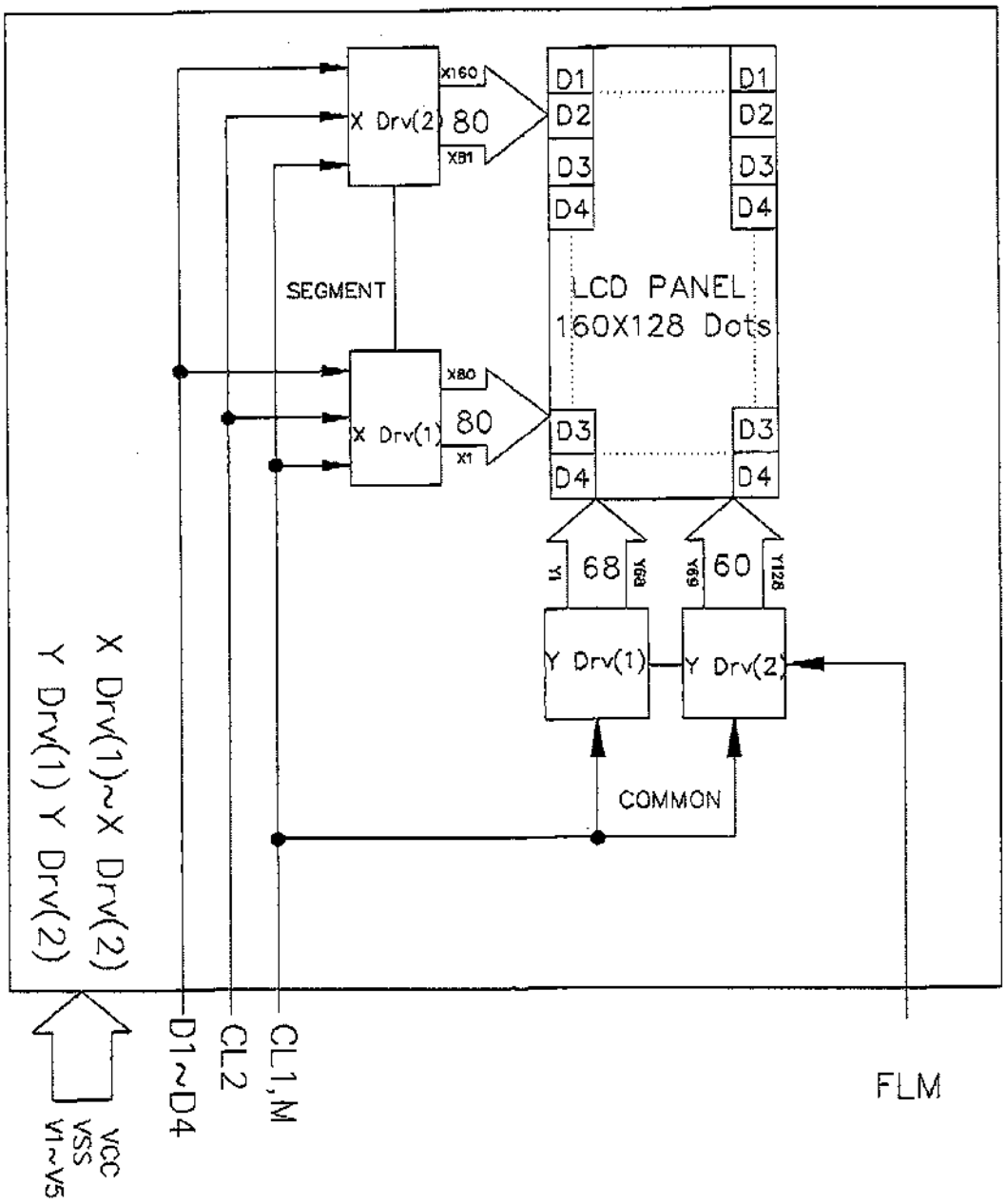
AT $\phi=0°$ $\theta=0°$

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	0℃	—	270	540	ms	NOTE 2
		25℃	—	140	280		
		50℃	—	50	120		
Response Time (fall)	Tf	0℃	—	760	1500	ms	NOTE 2
		25℃	—	210	420		
		50℃	—	120	240		

note:

S: TRANSFLECTIVE
T: TRANSMISSIVE
A: GRAY
C: YELLOW
E: BLUE
G: NORMALLY BLACK
J: NORMALLY WHITE

BLOCK DIAGRAM



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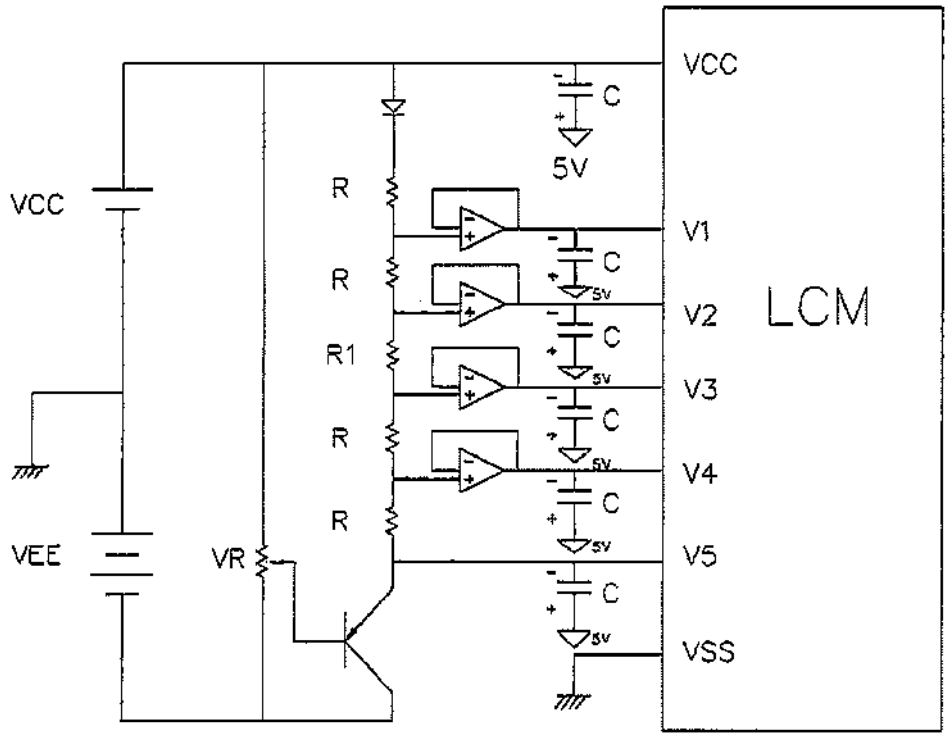
INTERNAL PIN CONNECTION

Pin No.	Symbol	Function	Level
1	FLM	First line marker	H
2	CL1	Display data latch clock	H → L
3	CL2	Display data shift clock	H → L
4	M	Control signal for AC driving	H/L
5	D1	Display data	H/L
6	D2	Display data	H/L
7	D3	Display data	H/L
8	D4	Display data	H/L
9	V1	Power supply for LCD(COM non-selected level)	
10	V2	Power supply for LCD(SEG non-selected level)	
11	V3	Power supply for LCD(SEG non-selected level)	
12	V4	Power supply for LCD(COM non-selected level)	
13	V5	Power supply for LCD(COM,SEG selected level)	
14	VCC	Power supply for logic (+5V) Power supply for LCD(COM,SEG selected level)	
15	VSS	Power supply (GND)	

POWER SUPPLY



R1=8R~10R(FOR 1/12 Bias R1=8R)

C=3.3uF

VR=10K~20K

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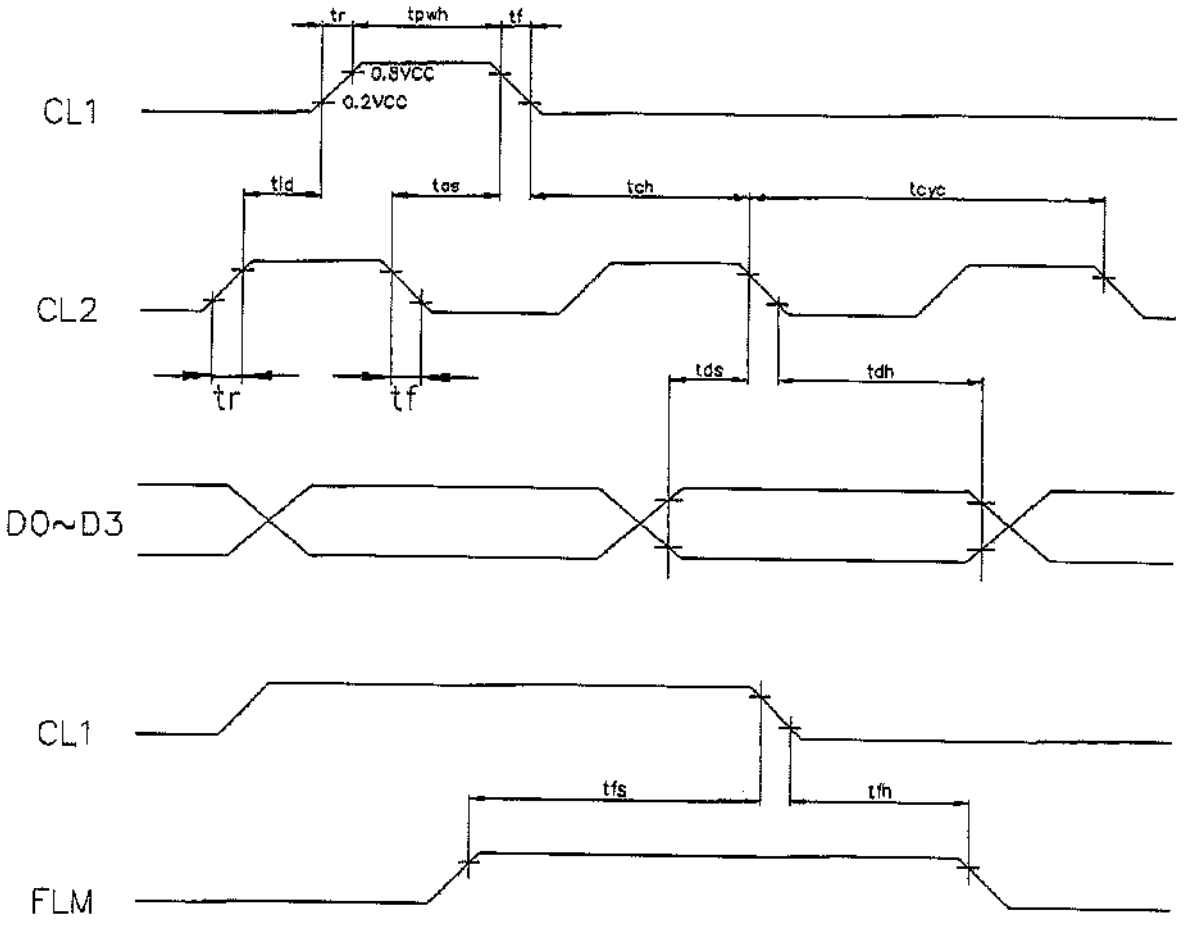
TIMING CHARACTERISTICS

Item	Symbol	Min.	Typ.	Max.	Unit
Clock cycle time	tcyc	160	–	–	ns
High-level pulse width	tpwh	125	–	–	ns
Latch delay time	tld	80	–	–	ns
Clock setup time	tcs	80	–	–	ns
Clock hold time	tch	120	–	–	ns
Rise and fall time	tr,tf	–	–	50	ns
Data setup time	tds	30	–	–	ns
Data hold time	tdh	50	–	–	ns
FLM setup time	tfs	100	–	–	ns
FLM hold time	tfh	100	–	–	ns



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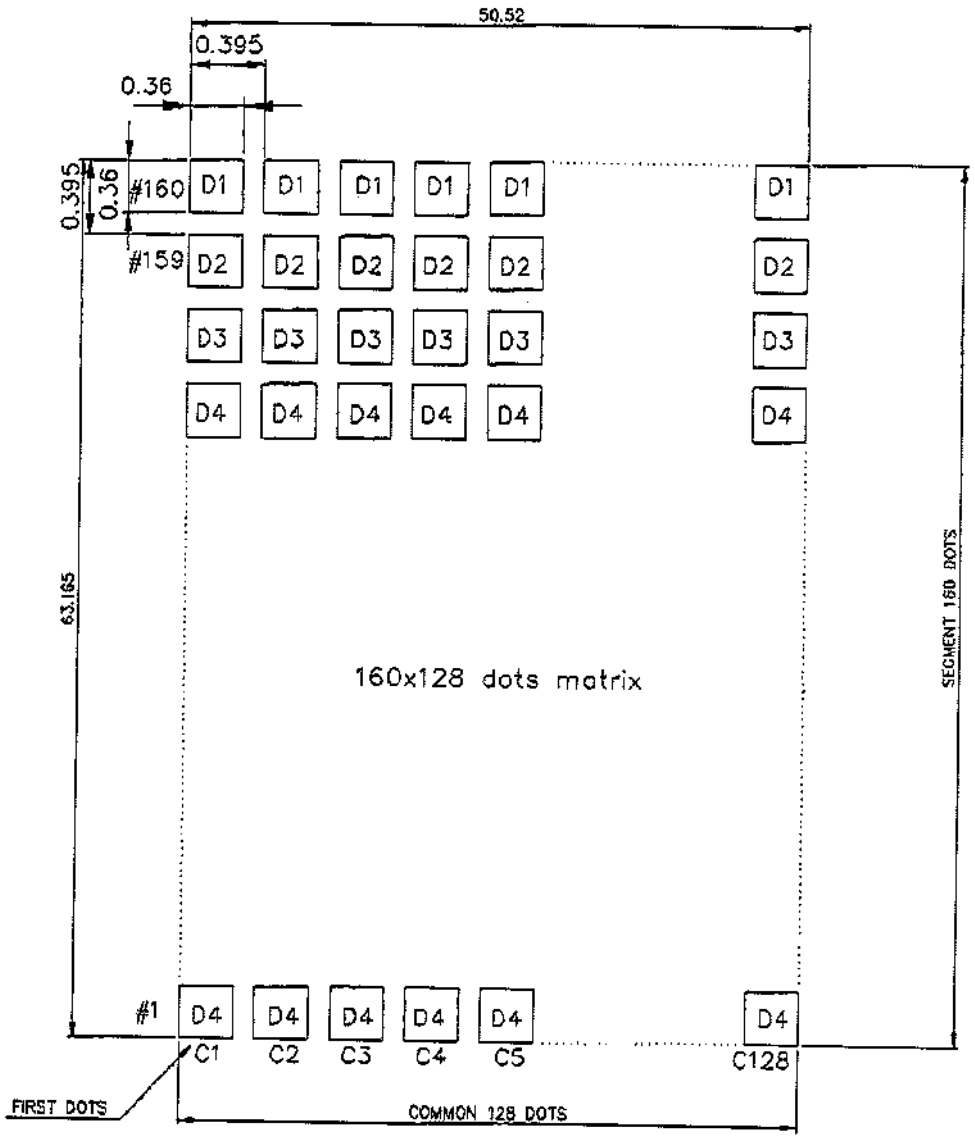
DISPLAY PATTERN



Unit: mm

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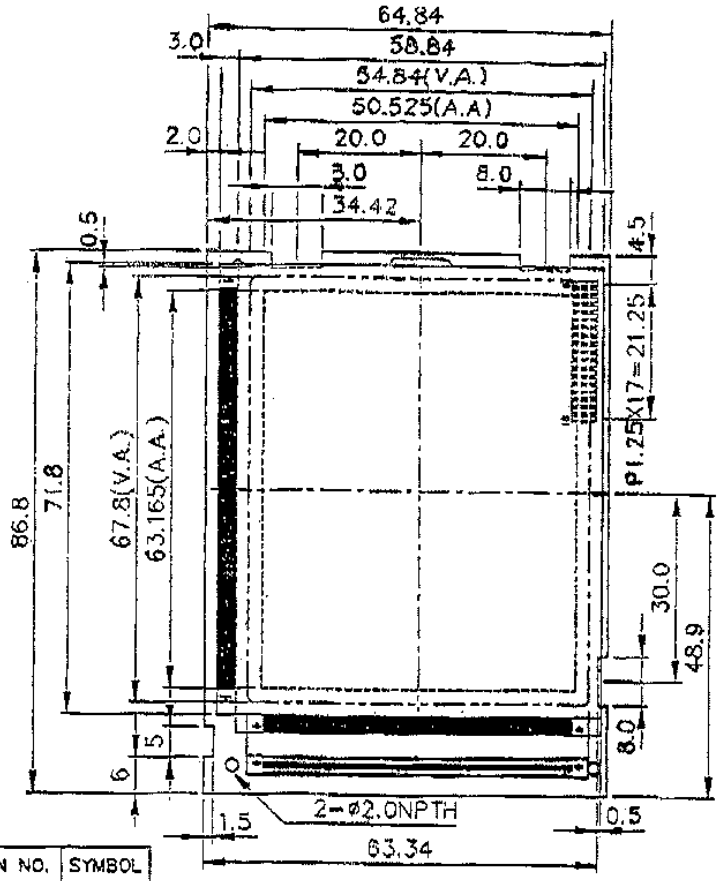

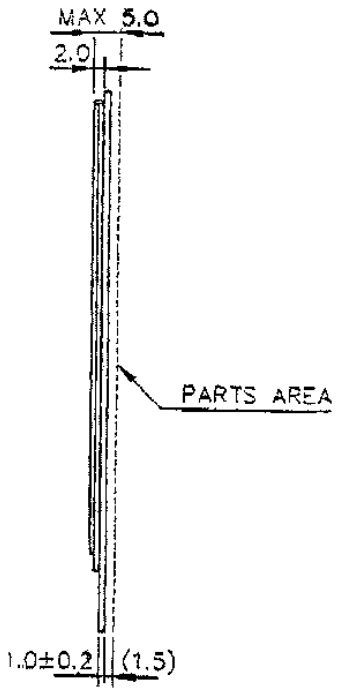

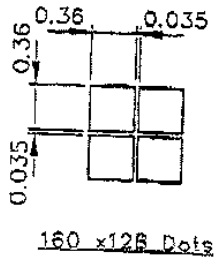

160 x128 Dots

PIN NO.	SYMBOL
1	FLM
2	CL1
3	CL2
4	M
5	D1
6	D2
7	D3
8	D4
9	V1
10	V2
11	V3
12	V4
13	V5
14	VCC
15	VSS
16	VEL
17	NC
18	VEL

NOTES :

1. RESOLUTION: 160X128 Dots
2. GENERAL TOLERANCE : ±0.5mm
3. LOGIC VOLTAGE : 3V/5V
4. WITHOUT CONTROLLER IC
5. BACKLIGHT : NONE

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