

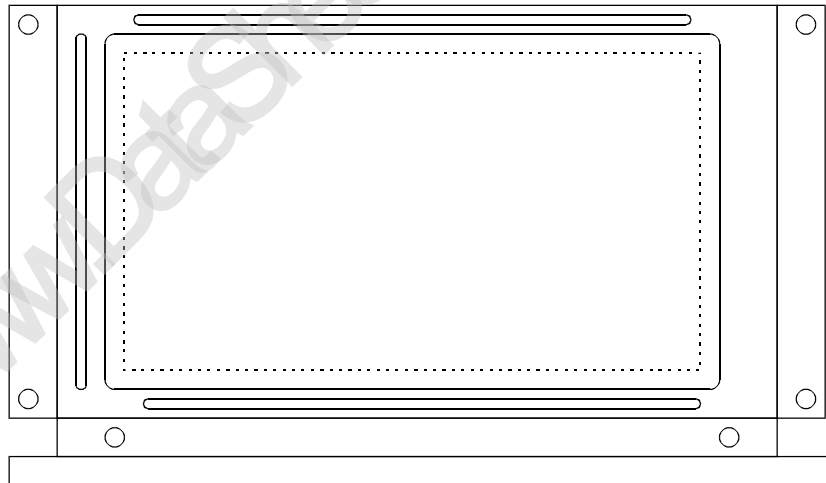
液晶之友 电话: 020-33819057
Http://www.lcdfriends.com

HANTRONIX

PRODUCT SPECIFICATION

HDM128GS24-1

240 x 128 GRAPHICS
LCD DISPLAY MODULE



HANTRONIX, INC.
10080 BUBB RD.
CUPERTINO, CA 95014

Q.A.:
JB

REV.:
1.0

HDM128GS24-1

SHEET 1 OF 10

DATE:
12/12/97

1. MECHANICAL DATA

(1) Part Name	
(2) Module Size	170.0 (W)mm x 102.0 (H)mm x MAX 14.0 (D)mm
(3) Dot Size	0.47 (W)mm x 0.47 (H)mm
(4) Dot Pitch	0.5 (W)mm x 0.5 (H)mm
(5) Number of Dots	240 (W) x 128 (H)Dots
(6) Duty	1/128
(7) LCD	Normally Black, Negative Type
(8) Viewing Direction	6 O'clock
(9) LCD Controller	BUILT-IN T6963C (TOSHIBA)
(10) Recommended FL Inverter	TDK CORP. CXA-L10L OR CXA-L10L-F
(11) Backlight	CCFT
(12) Weight	226.5 g

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2. ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

V_{SS}=0 V: Standard

ITEM	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	0	7.0	V	
Power Supply for LC Drive	VDD-VEE	0	24.0	V	
Input Voltage	V _I	VSS	VDD	V	
FL Driving Voltage	VFL	0	1500	V _{rms}	
FL Input Current	IFL	-	10.0	mArms	
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 T_a ≤ 50°C : 85%RH max

T_a > 50°C : Absolute humidity must be lower

than the humidity of 85%RH at 50°C

Note 2 T_a 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.

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3. ELECTRICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Logic Circuit Power Supply	VDD-VSS	-	4.75	5.0	5.25	V
LCD Driver Power Supply	VDD-VEE	-	17.05	17.8	18.55	V
Input Voltage	VIH	H level	0.7VDD	-	VDD	V
	VIL	L level	VSS	-	0.3VDD	V
Power Consumption Power Supply	Pd	VDD = 5.0V VEE = -15V	-	-	180	mW
Supply Current (LCD)	IDD	VDD = 5.0V VEE = -15V	-	-	18.0	mA
	IEE		-	-	6.0	
FL Starting Voltage	VFLS	0°C	900	-	-	Vrms
FL Driving Frequency	fFL	-	15	30	50	KHZ

4. OPTICAL CHARACTERISTICS

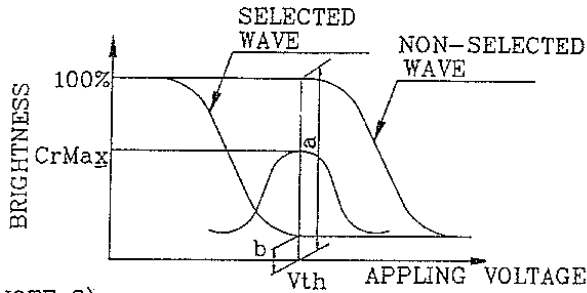
Ta=25°C

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Viewing Angle	θ	Cr \geq 2.0	50	-	-	deg	NOTE 5
	ϕ		-	-	± 40		
Contrast Ratio	Cr	$\phi=0^\circ, \theta=0^\circ$	10	-	-		NOTE 6
Response Time (rise)	Tr	$\phi=0^\circ, \theta=0^\circ$	-	200	500	ms	NOTE 2
Response Time (fall)	Tf	$\phi=0^\circ, \theta=0^\circ$	-	150	300	ms	

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(NOTE 1)

Definition of Operation Voltage(Vop)



*Conditions

Viewing Angle(a1):90

Frame Frequency:70Hz

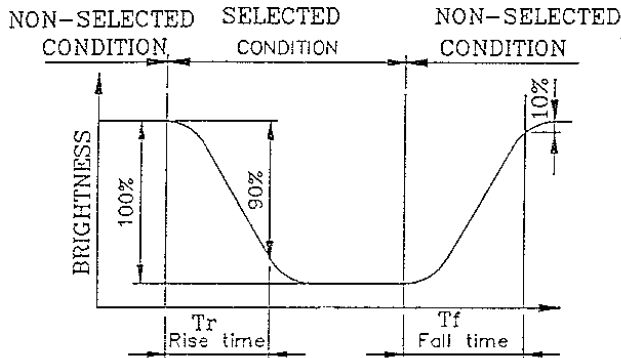
Applying Waveform:1/N duty 1/a bias

SELECTED WAVEFORM

$V_{op}=V_{DD}-V_{EE}$

(NOTE 2)

Definition of Response Time(Tr,Tf)



*Conditions

Operating Voltage:Vth

Viewing Angle(a1):90

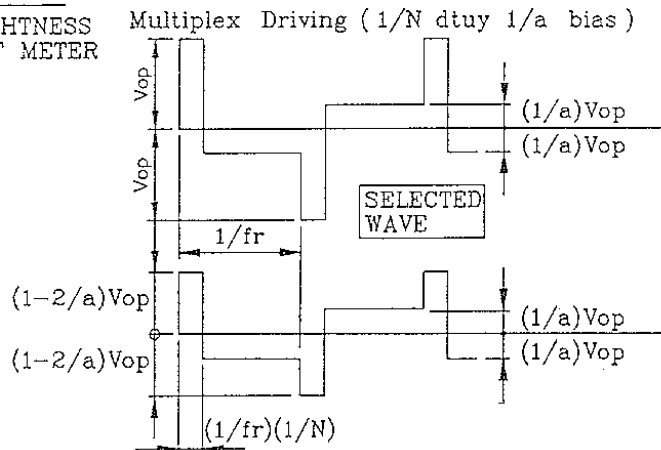
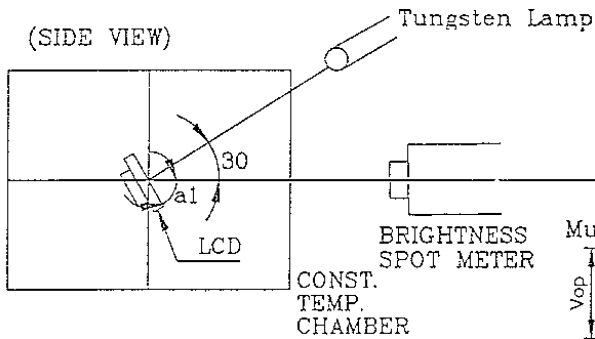
Frame Frequency:70Hz

Applying Waveform:1/N duty 1/a bias

SELECTED WAVEFORM

(NOTE 3)

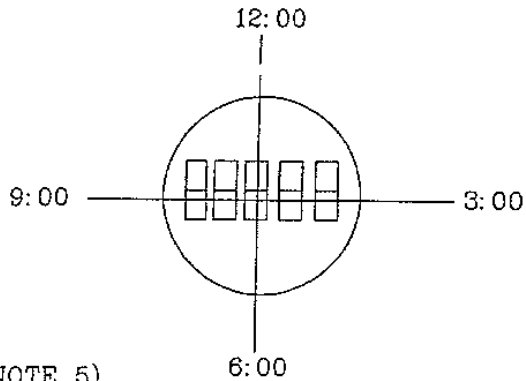
Description of Measuring Equipment and Driving Waveforms



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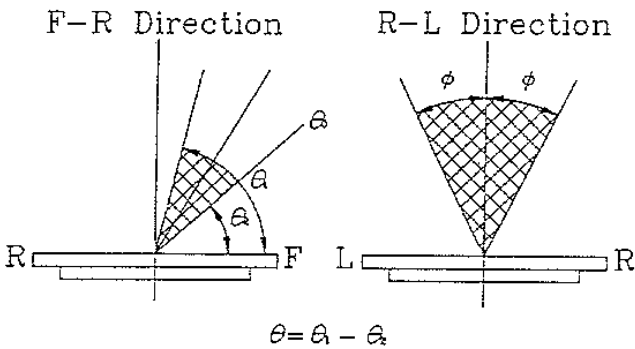
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle(a1,b1)



*Conditions

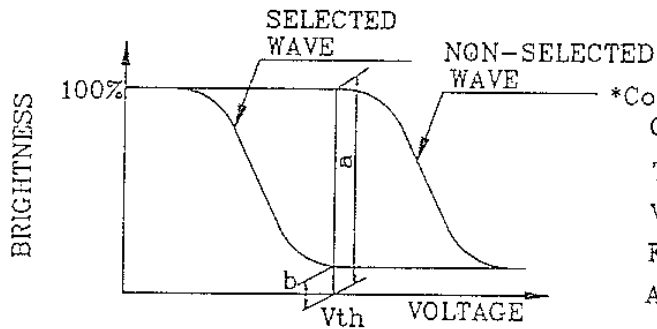
Operating Voltage: V_{th}

Frame Frequency: 70Hz

Applying Waveform: 1/N duty 1/a bias
SELECTED WAVEFORM

(NOTE 6)

Definition of Contrast Ratio (Cr)



*Conditions

Operating Voltage: V_{th}

Temperature : 25

Viewing Angle(a1) : 90

Frame Frequency: 70Hz

Applying Waveform: 1/N duty 1/a bias
SELECTED WAVEFORM

Contrast Ratio: $Cr = a/b$

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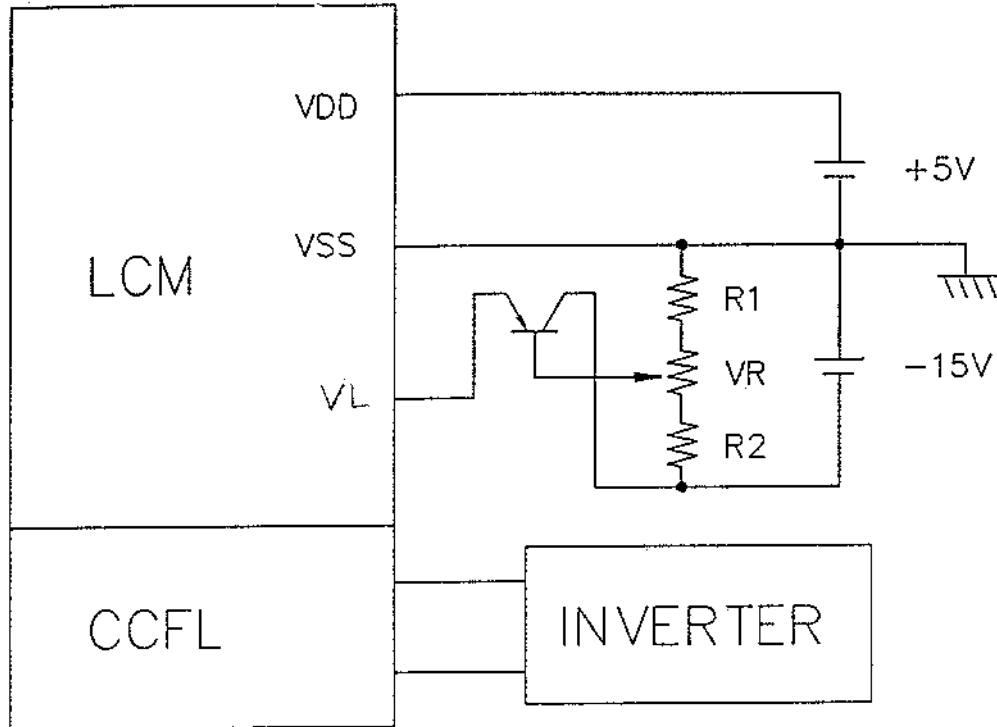
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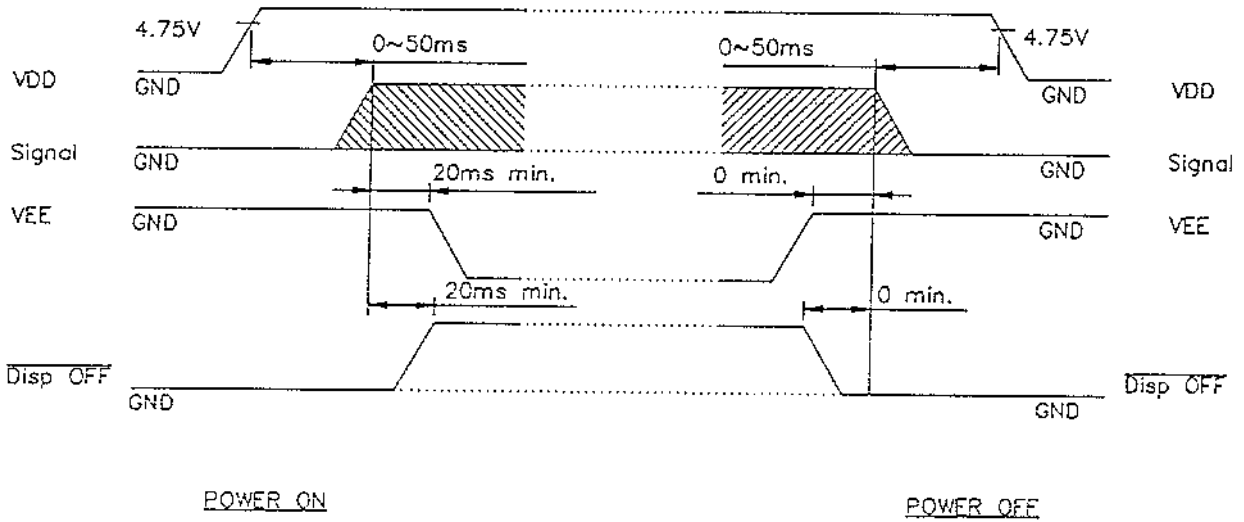
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7. POWER SUPPLY



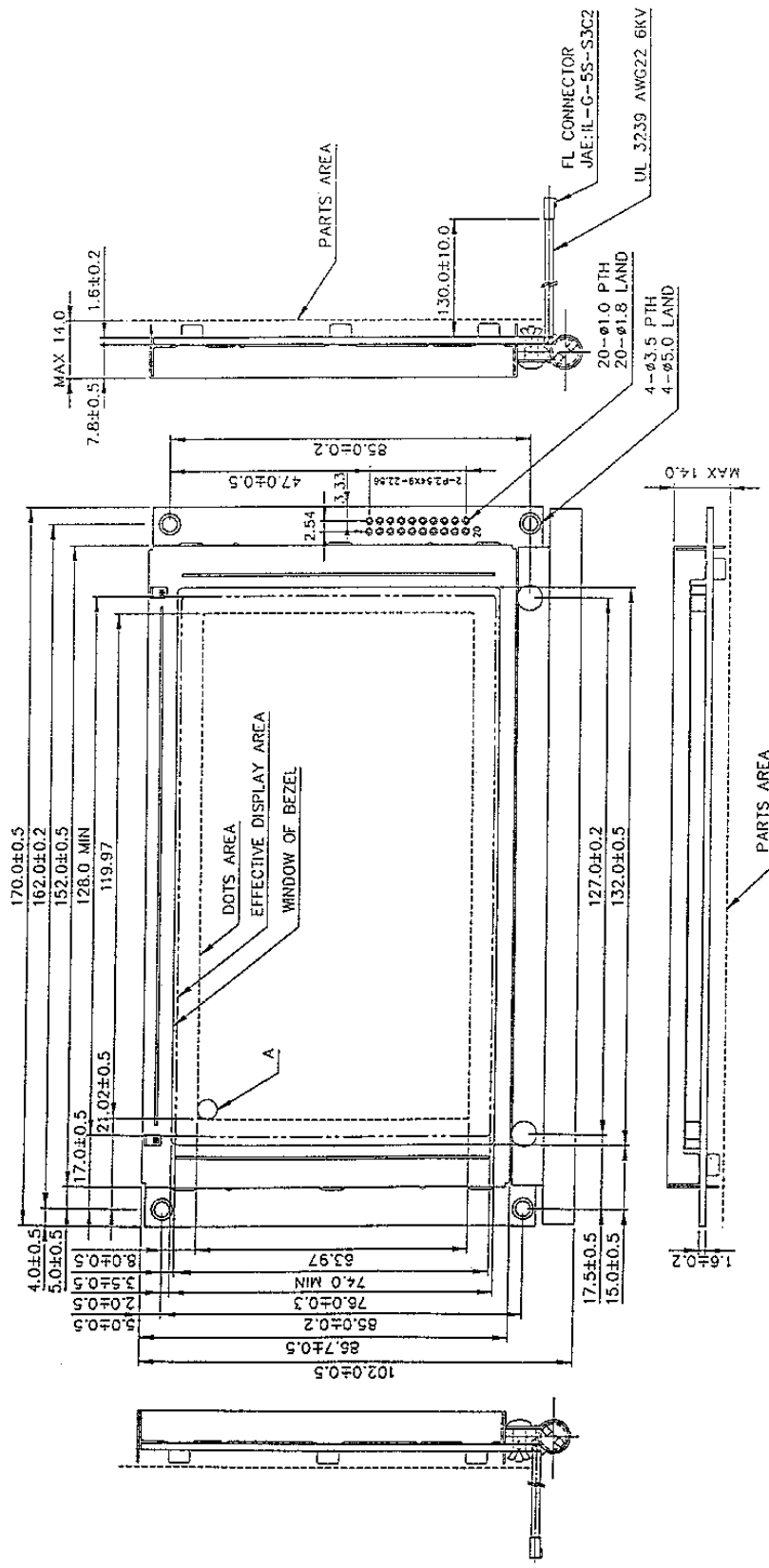
$$R1 + VR + R2 = 10K \sim 20K$$

8-2 POWER ON/OFF TIMING



The missing pixels may occur when the LCM is driven beyond above power interface timing sequence.

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