LMG5278XUFC-00T 640*480 Dots

FEATURES

- Black on White Film STN Type
- Transmissive Mode
- High Brightness CFL Backlight
- High Contrast LC Material
- Wide Viewing Angle

MECHANICAL DATA

Item	Value	Unit
Module Dimensions	257.5*174*7	mm
Viewing Area	196*148	mm
Resolution	640*480	dots
Dot Size	0.27*0.27	mm
Dot Pitch	0.3*0.3	mm
Weight	350	g

OPTICAL DATA

Item	Symbol	Condition	Min	Typ	Max	Unit
Contrast Ratio	K	Ø=10°, Q=0°, Note 1	14	18	-	-
Brightness	-	T=25°C, Note 9	40.0	60.0	-	cd/m^2
Viewing Direction		-		12		o'clock
Viewing Angle	Ø2 - Ø1	K=2, Note 1	30	40	-	degree
Response Time (Rise)	t_R	Ø=10°, Q=0°, Note 1	-	160	210	ms
Response Time (Fall)	t_F	Ø=10°, Q=0°, Note 1	-	110	160	ms

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Min	Max	Unit
Supply Voltage (Logic)	V_{DD} - V_{SS}	-	0	6.5	V
Supply Voltage (LC Drive)	V_{DD} - V_{EE}	-	0	27.5	V
Input Voltage	V_I	Note 2	-0.3	0.3+VDD	V
Operating Temperature	T_{OP}	Note 5,6	0	50	°C
Storage Temperature	T_{ST}	Note 7	-20	60	°C

DATA INTERFACE PIN ASSIGNMENT

Pin No	Symbol	Level	Function
1	FRAME	H	First Line Marker
2	LOAD	H->L	Data Latch
	CP	H->L	Data Shift
4	Not DISP OFF	H/L	High for ON / Low for OFF
5	VDD	-	Power Supply for Logic
6	VSS	-	Ground
7	VEE	-	Power Supply for LC
8-11	UD0 - UD3	H/L	Display Data (Upper Half)
12-15	LD0 - LD3	H/L	Display Data (Lower Half)

CFL INTERFACE PIN ASSIGNMENT

Pin No	Symbol	Level	Function
1	GND	-	CFL Ground
2	NC	-	No connection
3	NC	-	No connection
4	HV	-	Power supply for CFL

Note1: Definition of optical data, see page 84

Note 2: Applied to NotDISP.OFF, FRAME, LOAD, CP, UD0-UD3, LD0-LD3

Note 3: FRAME=140Hz, UD0-UD3=0.1.0.1...LD0-LD3=1.0.1.0..VDD-VEE=22.7V,T=25°C

Note 4: Recommended LC driving voltage may fluctuate about +-1.0V by each module

Note 5: A higher starting voltage will be needed for CFL at 0°C. Lifetime of CFL is reduced at 0°C.

ELECTRICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage (Logic)	V_{DD} - V_{SS}	T=25°C	3.0	3.3/5.0	5.25	V
Supply Voltage (LC Drive)	V_{EE} - V_{SS}	T=25°C	-	-22.0	-	V
Supply Current	I_{DD}	Note 3, 3.3V/5V	-	22/20	32/30	mA
	I_{EE}	Note 3, 3.3V/5V	-	20/18	27/25	mA
Input Voltage (High Level)	V_{IH}	High Level, Note 2	0.8* VDD	-	VDD	V
Input Voltage (Low Level)	V_{IL}	Low Level, Note 2	0	-	0.2* VDD	V
Frame Frequency	f_{FLM}	Note 8	120	130	140	Hz
Duty Ratio		-		1/242		-
Recommended LC Drive Voltage	V_{DD} -V_O	Duty=1/242 T=0°C, Note 4	-	23.9	-	V
		Duty=1/242 T=25°C, Note 4	-	22.7	-	V
		Duty=1/242 T=45°C, Note 4	-	21.6	-	V
Backlight Lamp Voltage	V_{BL}	T=25°C	-	360	-	Vrms
Backlight Lamp Frequency	f_{BL}	T=25°C	30	70	85	kHz
Backlight Lamp Current	I_{BL}	T=25°C	2.5	5.0	5.5	mArms
Lamp Start Voltage	V_S	T=25°C, Note 10	1000	-	1500	V

TIMING CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit
Clock frequency	fCP	-	-	6.5	MHz
Clock pulse width	tW	63	-	-	ns
Rise, Fall time	tr, tf	-	-	20	ns
Data set up time	tDSU	50	-	-	ns
Data hold time	tDHD	50	-	-	ns
LOAD set up time	tLSU	80	-	-	ns
LOAD->Clock time, 3.3V	tLC	120	-	-	ns
LOAD->Clock time, 5.0V	tLC	80	-	-	ns
FRAME set up time	tsetup	100	-	-	ns
FRAME hold time	thold	100	-	-	ns
LOAD pulse width	tWC	125	-	-	ns

INVERTER AND CONNECTORS

Recommended Inverter	Starter Kit
HITACHI INVC378, INVC218	START5278
Data Connector	**Data Housing Connector**
MOLEX 53261-1510	51021-1500
Lamp Connector	**Lamp Housing Connector**
MITSUMI M63M83-04	M61M73-04 , M60-04-30-114P or M60-04-30-134P

Note 5: Background colour of the LCD changes depending on temperature. Between 40-50°C optical characteristics of the LCD like contast and viewing angle change but the display remains readable.

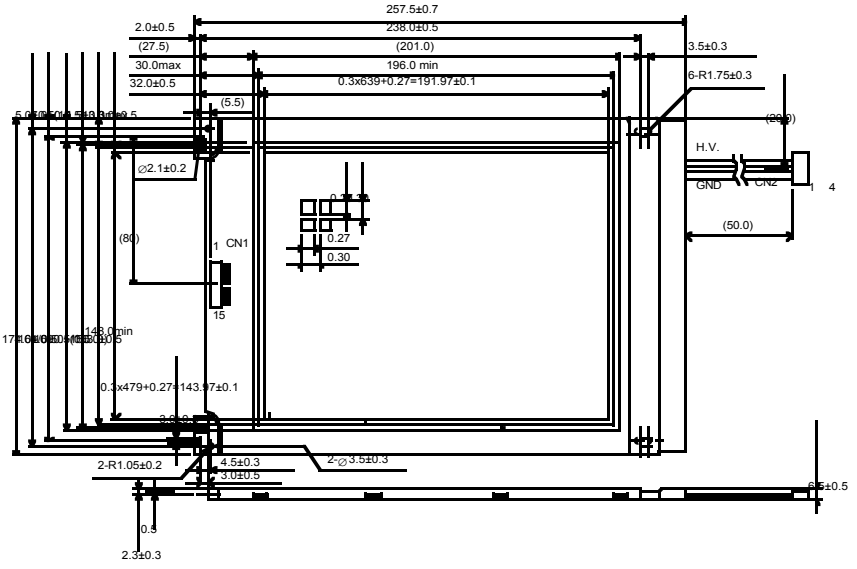
Note 7: Storage at -25°C < 48 hr, at 60°C < 168 hr

Note 8: Need to make sure of flickering and rippling of display when setting the Frame Frequency in your set

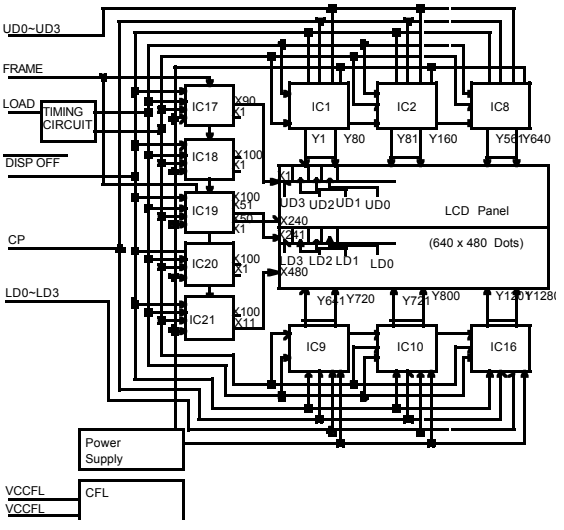
Note 9: Measurement after 10 minutes of CFL operating. Brightness control at 100%

Note 10: Starting discharge voltage is increased when LCM is operating at lower temperature. Please check the characteristics of inverter before applying.

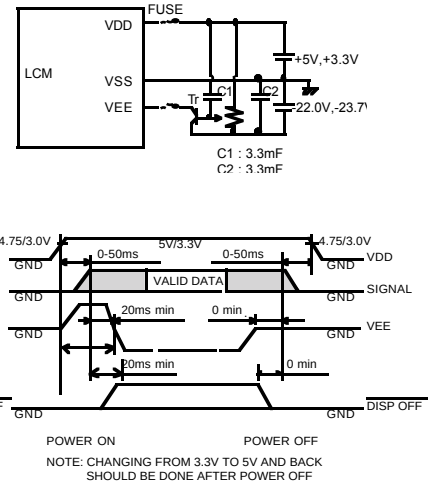
MECHANICAL DIMENSIONS



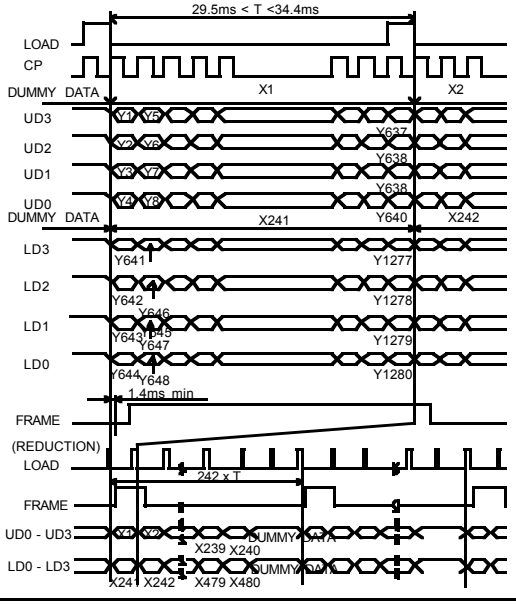
BLOCK DIAGRAM

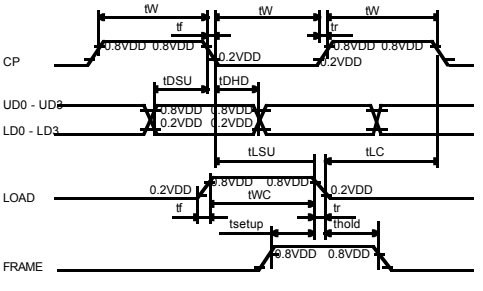


POWER SUPPLY / POWER UP TIMING DIAGRAM



INTERFACE TIMING DIAGRAM





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