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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 0.0	Aug.15,'2002	All	All	Tentative Specification was first issued.
Ver 0.1	Oct.07,'2002	7	3.1	Power Supply Current White: TBD(Typ.)↔400(Typ.). Power Supply Current Black: TBD(Typ.)↔550(Typ.).
		9	3.2	Lamp Turn On Voltage: (1150)(25°C)(Max.)↔(1180)(25°C)(Max.). Lamp Turn On Voltage: (1360)(0°C)(Max.)↔(1330)(0°C)(Max.).
			7.2	Response Time TR:5(Typ.) / TF:12(Typ.) ↔ TR:6(Typ.) / TF:17(Typ.) Response Time TR:TBD(Max.) / TF:TBD(Max.) ↔ TR:10(Max.) / TF:25(Max.)
Ver.1.0	Nov.25,'2002		1.5	Module Size Horizontal : 320.5(Min.)/321.5(Max.) Vertical : 244.9(Min.)/245.9(Max.) Depth : 10(Max.)
			2.2.2	Lamp Voltage VL : 603(Min.)/737(Max.) ↔ -(Min.)/2.5K(Max.) Lamp Current IL : 2.0(Min.)/9(Max.) ↔ -(Min.)/8.5(Max.) Lamp Frequency FL : 30(Min.) ↔ -(Min.)
			3.2	Lamp Input Voltage VL : 580(Typ.)/638(Max.) ↔ 585(Typ.)/644(Max.) Lamp Turn On Voltage Vs : 1330(0°C)(Max.) ↔ 1350(0°C)(Max.) Operating Frequency FL :30(Min.)/45(Typ.) ↔ 40(Min.)/50(Typ.) Power Consumption PL : 9.28(Typ.) ↔ 9.36(typ.)
			7.2	White Variation dW : 1.35(Max.) ↔ 1.40(Max.) Color Chromaticity Rx : 0.597(Min.)/0.627(typ.)/0.657(Max.) ↔ 0.602(Min.)/0.633(typ.)/0.663(Max.) Gx : 0.265(Min.)/0.295(Typ.)/0.325(Max.) ↔ 0.270(Min.)/0.300(Typ.)/0.330(Max.) Gy : 0.559(Min.)/0.589(Typ.)/0.619(Max.) ↔ 0.556(Min.)/0.586(Typ.)/0.616(Max.) Bx : 0.114(Min.)/0.144(Typ.)/0.174(Max.) ↔ 0.112(Min.)/0.142(Typ.)/0.172(Max.)
Ver.2.0	Jan.06,'2003		7.2	Color Chromaticity Rx : 0.602(Min.)/0.633(typ.)/0.663(Max.)↔ 0.597(Min.)/0.627(typ.)/0.657(Max.) Gx : 0.270(Min.)/0.300(Typ.)/0.330(Max.)↔ 0.265(Min.)/0.295(Typ.)/0.325(Max.) Gy : 0.556(Min.)/0.586(Typ.)/0.616(Max.)↔ 0.559(Min.)/0.589(Typ.)/0.619(Max.) Bx : 0.112(Min.)/0.142(Typ.)/0.172(Max.)↔ 0.114(Min.)/0.144(Typ.)/0.174(Max.)
Ver.2.1	Jan.10,'2003		7.2	Color Chromaticity Rx : 0.597(Min.)/0.627(typ.)/0.657(Max.) ↔ 0.603(Min.)/0.633(typ.)/0.663(Max.) Ry : 0.331(Min.)/0.361(Typ.)/0.391(Max.) ↔ 0.327(Min.)/0.357(Typ.)/0.387(Max.)

REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver.2.1	Jan.10,'2003	17	7.2	Gx : 0.266(Min.)/0.296(Typ.)/0.326(Max.) ⇄ 0.270(Min.)/0.300(Typ.)/0.330(Max.) Gy : 0.561(Min.)/0.591(Typ.)/0.621(Max.) ⇄ 0.556(Min.)/0.586(Typ.)/0.616(Max.) Bx : 0.111(Min.)/0.141(Typ.)/0.171(Max.) ⇄ 0.112(Min.)/0.142(Typ.)/0.172(Max.) By : 0.067(Min.)/0.097(Typ.)/0.127(Max.) ⇄ 0.064(Min.)/0.094(Typ.)/0.124(Max.)
Ver.2.2	Mar.21,'2003	10	3.2	Modified power consumption Unit from mW to W
Ver.2.3	Jun.05,'2003	11	4.1	Modify LAMP CONNECTOR : JST BHSR-03VS-1 → JST BHR-03VS-1

1. GENERAL DESCRIPTION

1.1 OVERVIEW

M150X4-L06 is a 15.0" TFT Liquid Crystal Display module with 2 CCFL Backlight units and 20 pins LVDS interface. This module supports 1024 x 768 XGA mode and can display 16.2M colors. The optimum viewing angle is at 6 o'clock direction. The inverter module for Backlight is not built in.

1.2 FEATURES

- XGA (1024 x 768 pixels) resolution
- DE(Data Enable) only mode
- LVDS Interface with 1pixel/clock

1.3 APPLICATION

- Desktop monitors

1.4 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	304.128(H) x 228.096(V) (15.0" diagonal)	mm	(1)
Bezel Opening Area	307.5(H) x 231.4(V)	mm	
Driver Element	a-Si TFT active matrix	-	-
Pixel Number	1024 x R.G.B. x 768	pixel	-
Pixel Pitch	0.297(H) x 0.297(W)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16,194,277	color	-
Transmissive Mode	Normally white	-	-

1.5 MECHANICAL SPECIFICATIONS

Item	Min.	Typ.	Max.	Unit	Note	
Module Size	Horizontal(H)	320.5	321.0	321.5	mm	(1)
	Vertical(V)	244.9	245.4	245.9	mm	
	Depth(D)	-	9.7	10	mm	(1)(2)
Weight	-	-	930	g	-	

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

Note (2) The depth is without connector.

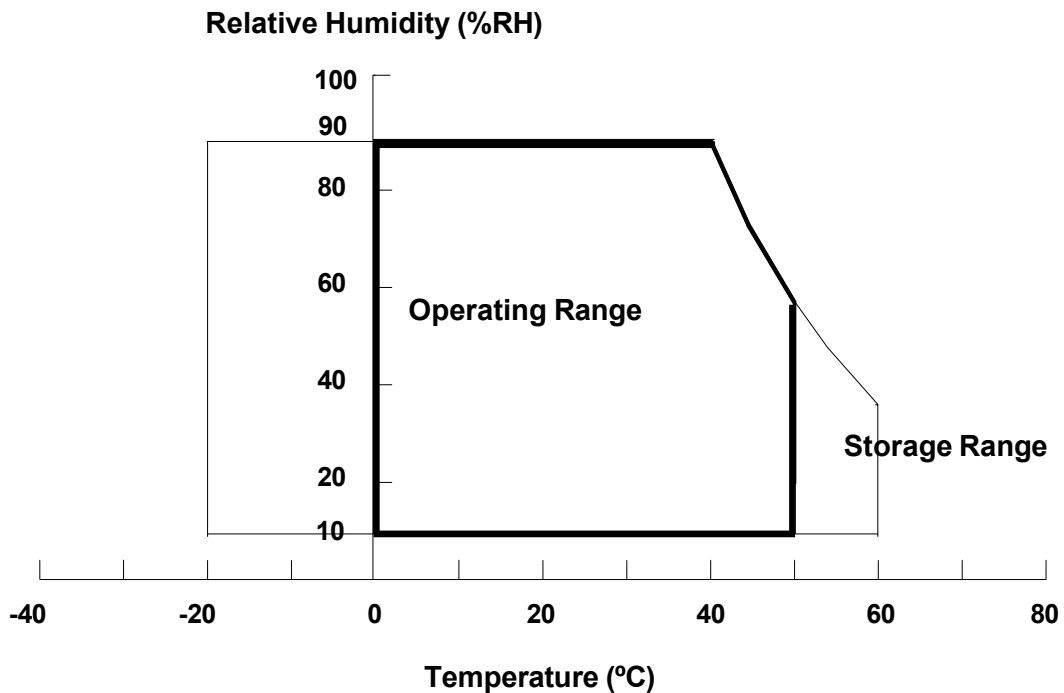
2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-20	+60	°C	(1)
Operating Ambient Temperature	T _{OP}	0	+50	°C	(1), (2)
Storage Humidity	H _{ST}	10	90	%	-
Operation Humidity	H _{OP}	10	90	%	-
Shock (Non-Operating)	S _{NOP}	-	50	G	(3), (5)
Vibration (Non-Operating)	V _{NOP}	-	1.5	G	(4), (5)

Note (1) Temperature and relative humidity range is shown in the figure below.

- (a) 90 %RH Max. (Ta ≤ 40 °C).
- (b) Wet-bulb temperature should be 39 °C Max. (Ta > 40 °C).
- (c) No condensation of water.



Note (2) The temperature of panel surface should be 0 °C Min. and 60 °C Max.

Note (3) 11ms, 1 time each -X, -Y and -Z directions

Note (4) 10 ~ 500 Hz, 1 cycle/20min. 1.5mm max, 1 hour each X, Y and Z directions

Note (5) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.

2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	V _{DD}	-0.3	4.0	V	

2.2.2 BACKLIGHT UNIT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Lamp Voltage	V _L	-	2.5K	V _{RMS}	(1), (2), I _L = 8 mA
Lamp Current	I _L	-	8.5	mA _{RMS}	(1), (2)
Lamp Frequency	F _L	-	80	KHz	

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for lamp (Refer to Section 3.2 for further information).

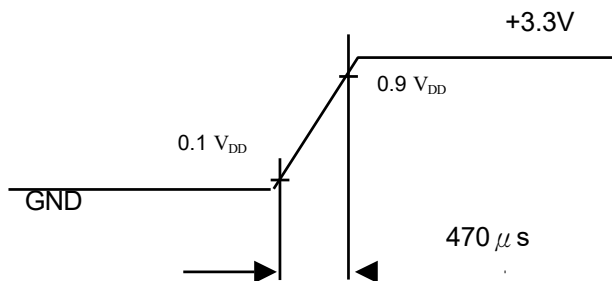
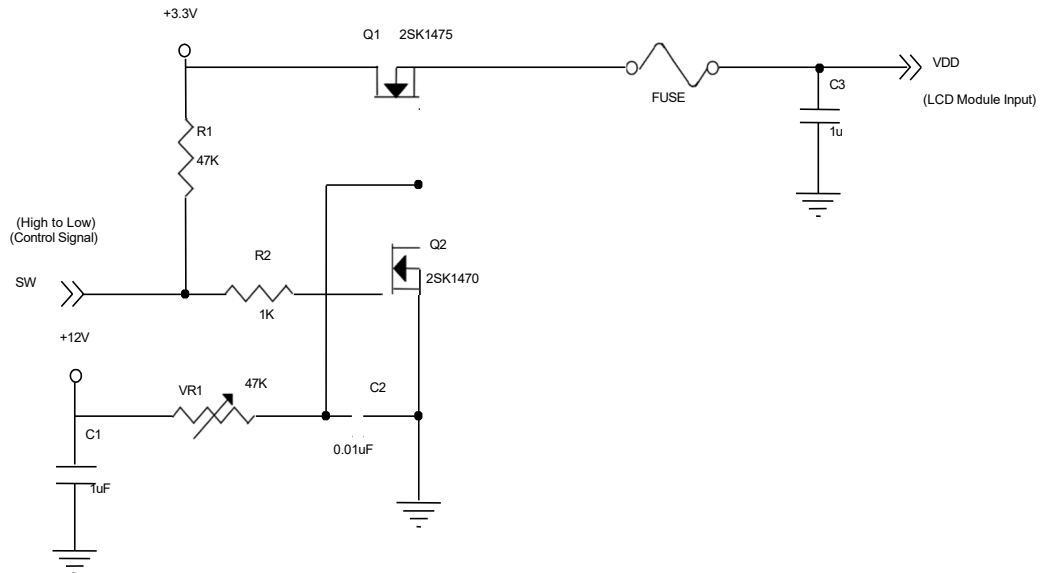
3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE⁽¹⁾

Parameter	Symbol	Value			Unit	Note	
		Min.	Typ.	Max.			
Power Supply Voltage	V_{DD}	3.0	3.3	3.6	V	-	
Ripple Voltage	V_{RP}	-	-	100	mVp-p	-	
Rush Current	I_{RUSH}	-	-	2.0	A	(2)	
Power Supply Current	White	-	400	-	mA	(3)a	
	Black	-	550	-	mA	(3)b	
Differential Input Voltage for LVDS Receiver Threshold	"H" Level	V_{IH}	-	-	100	mV	-
	"L" Level	V_{IL}	-100	-	-	mV	-
Terminating Resistor	R_T	-	100	-	Ohm	-	

Note (1) The module should be always operated within above ranges.

Note (2) Measurement Conditions:



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