TO : Natec(Panasonic Project)

Date : Dec., 20, 2010

Customer Acceptance Specification

Model: HSD101PFW2-C00

相關文件:DC170-006683

Accepted by:	
Signature	Date
Proposed by: Technical Service Division	
Signature	Date
詹哲崇	2010.12.31

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Note: (1) The information contained herein is tentative and may be changed without prior notices
(2) Please contact HannStar Display Corp. before designing your product based on this module specification.
(3) The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by HannStar for any intellectual property claims or other problems that may result from application based on the module described herein.

1.0 GENERAL DESCRIPTION

1.1 Introduction

HannStar Display model HSD101PFW2-C** is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 10.1 (16:9) inch diagonally measured active display area with WSVGA (1024 horizontal by 600 vertical pixel) resolution.

1.2 Features

- 10.1 (16:9 diagonal) inch configuration
- One channel LVDS interface
- 262K color by 6 bit R.G.B signal input
- RoHS Compliance
- Halogen Free

1.3 Applications

- Mobile NB
- Digital Photo frame
- Display terminal for AV application

1.4 General information

Item	Specification	Unit
Outline Dimension	235 x 143 x 5.0 (Typ.)	mm
Display area	222.72(H) x 125.28(V)	mm
Number of Pixel	1024 RGB (H) x 600(V)	pixels
Pixel pitch	0.2175(H) x 0.2088(V)	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally white	
NTSC	50	%
Surface treatment	Anti-Glare (3H)	
Weight	185 (Typ.)	g
Back-light	White LED	
Power Consumption	0.7W (Max.)/Logic 2.8W (Max.)/BL	W

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast		CR	Θ=0 Normal viewing angle	400	500	–		(1)(2)(4)
Response time		RT		–	16	32	msec	(1)(3)
White luminance (5 point)		Y_L		240	300	–	cd/m^2	(1)(4)(5) (I_L=18mA)
Color chromaticity (CIE1931)	Red	R_x		(0.543)	(0.593)	(0.643)		
		R_Y		(0.305)	(0.355)	(0.405)		
	Green	G_x		(0.272)	(0.322)	(0.372)		
		G_Y		(0.500)	(0.550)	(0.600)		
	Blue	B_x		(0.102)	(0.152)	(0.202)		
		B_Y		(0.046)	(0.096)	(0.146)		
	White	W_x		0.263	0.313	0.363		
		W_y		0.279	0.329	0.379		
Viewing angle	Hor.	Θ_L	CR>10	60	70	–		(1)(4)
		Θ_R		60	70	–		
	Ver.	Θ_U		40	50	–		
		Θ_D		50	60	–		
Brightness uniformity		B_{UNI}	Θ=0 (5point)	80	–	–	%	(5)
Brightness Uniformity		B_{UNI}	Θ=0 (13 points)	70	–	–	%	(6)

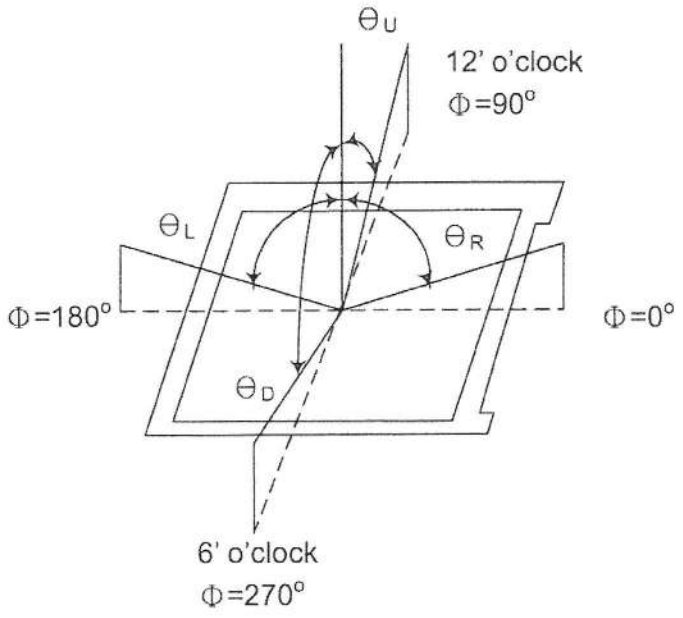
3.2 Measuring Condition

- Measuring surrounding : dark room
- Ambient temperature : 25±2°C
- 15min. warm-up time.

3.3 Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.
- Measuring spot size : 20 ~ 21 mm

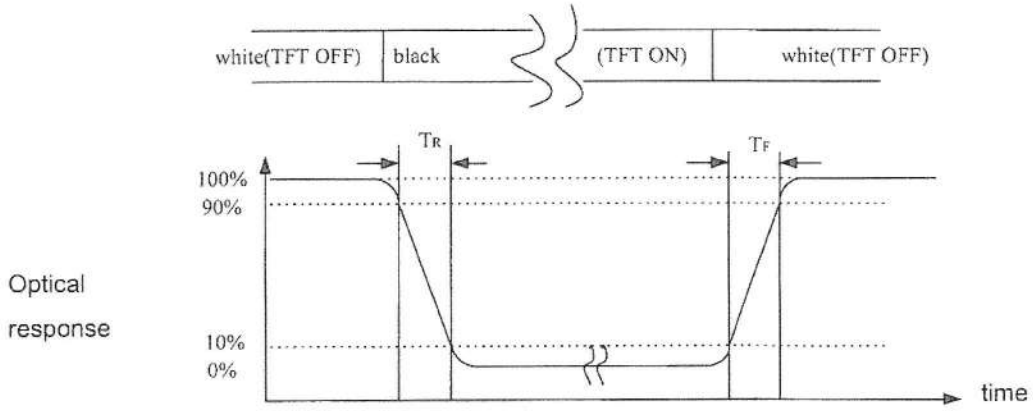
Note (1) Definition of Viewing Angle:



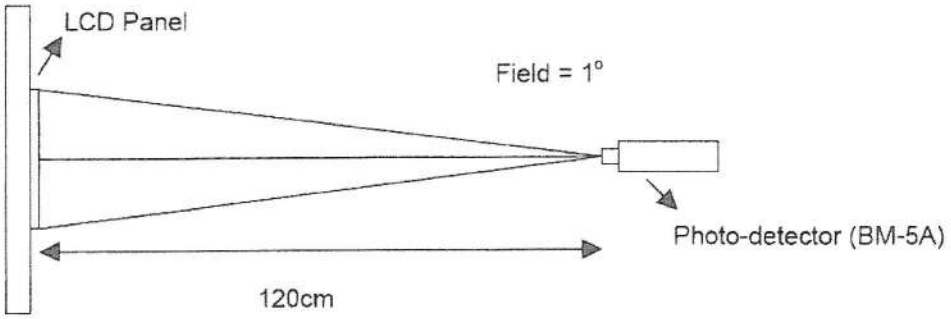
Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time : Sum of T_R and T_F

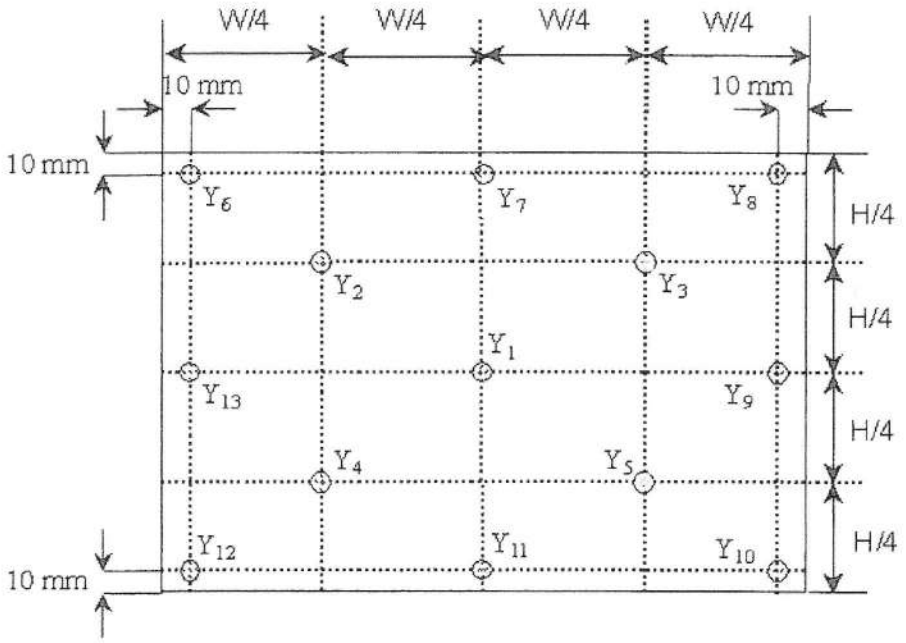


Note (4) Definition of optical measurement setup



Note (5) Definition of Average Luminance Uniformity of White (5 Point)

$$\text{Average Luminance Uniformity} = \frac{Y_1+Y_2+Y_3+Y_4+Y_5}{5}$$



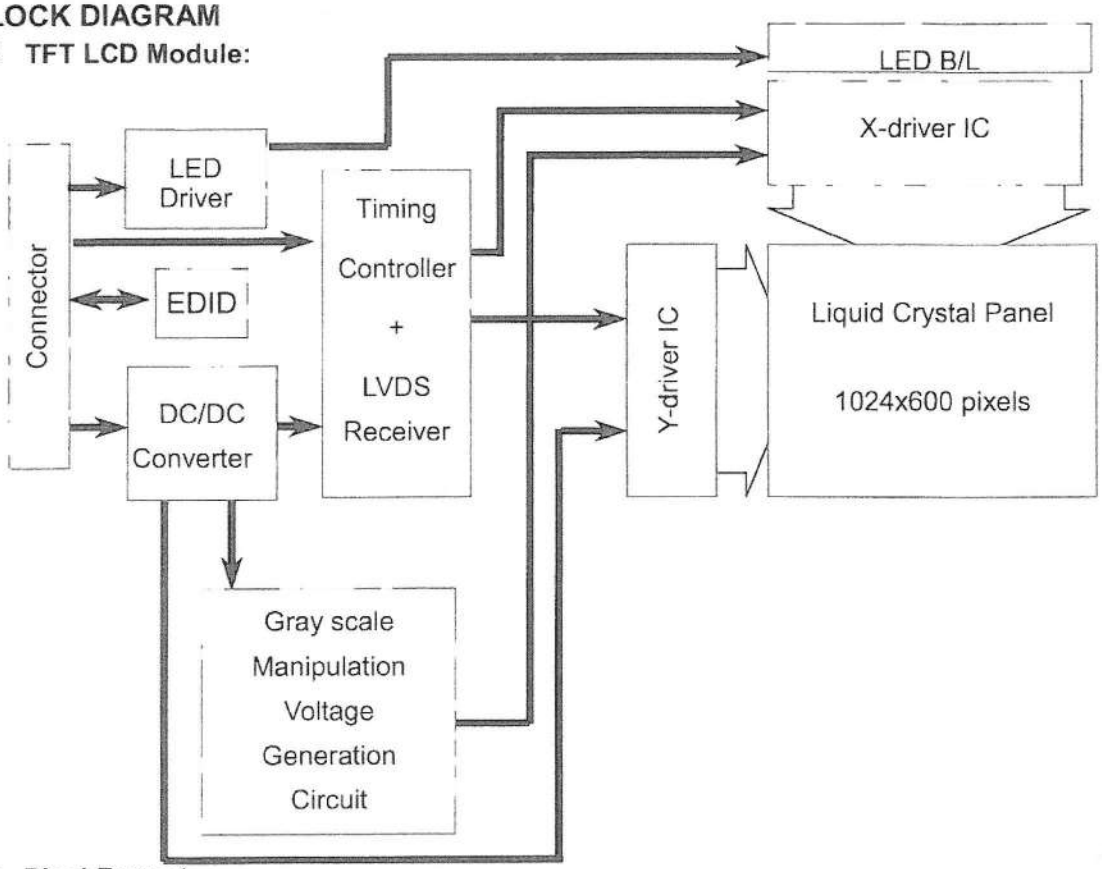
Note (6) Definition of brightness uniformity

$$\text{Luminance uniformity(5 points)} = \frac{\text{(Min Luminance of 5 points)}}{\text{(Max Luminance of 5 points)}} \times 100\%$$

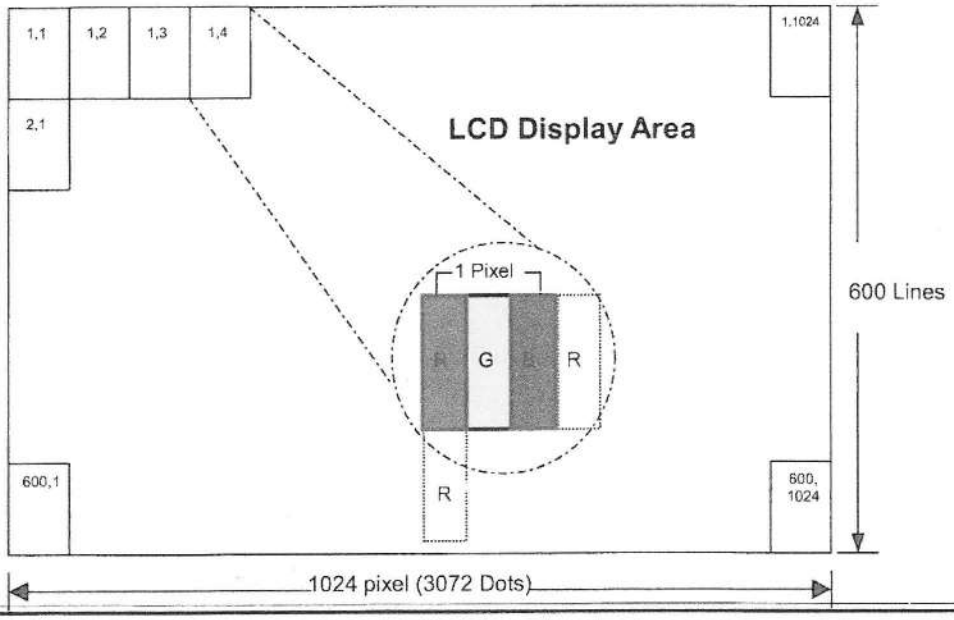
$$\text{Luminance uniformity(13points)} = \frac{\text{(Min Luminance of 13 points)}}{\text{(Max Luminance of 13 points)}} \times 100\%$$

4.0 BLOCK DIAGRAM

4.1 TFT LCD Module:



4.2 Pixel Format



5.0 INTERFACE PIN CONNECTION

5.1 **TFT LCD Module :** CN1 (Input signal): FI-XB30SL-HF10(JAE or equivalent)

Pin No.	Signal	Description
1	GND	Ground
2	VCC	(+)3.3V Power
3	VCC	(+)3.3V Power
4	V_EDID	3.3V Power for NB
5	ADJ	Adjust for LED brightness
6	CLK_EDID	EDID Clock for NB
7	DATA_EDID	EDID Data for NB
8	RXIN0-	LVDS Signal(-)-------channel 0
9	RXIN0+	LVDS Signal(+)-------channel 0
10	GND	Ground
11	RXIN1-	LVDS Signal(-)-------channel 1
12	RXIN1+	LVDS Signal(+)-------channel 1
13	GND	Ground
14	RXIN2-	LVDS Signal(-)-------channel 2
15	RXIN2+	LVDS Signal(+)-------channel 2
16	GND	Ground
17	RXCLKIN-	LVDS Clock Signal(-)
18	RXCLKIN+	LVDS Clock Signal(+)
19	GND	Ground
20	NC	NC
21	NC	NC
22	GND	Ground
23	GND	Ground
24	V_LED	Power Supply for LED(+)5V
25	V_LED	Power Supply for LED(+)5V
26	V_LED	Power Supply for LED(+)5V
27	NC	NC
28	NC	NC
29	NC	NC
30	NC	NC

Note : The brightness of LCD panel could be changed by adjusting ADJ

6.0 ELECTRICAL CHARACTERISTICS

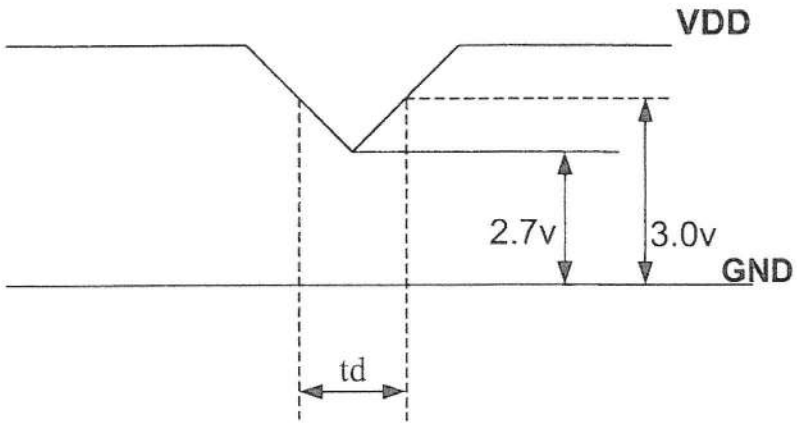
6.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	V_{DD}	3.0	3.3	3.6	V	Note (1)
Current of power supply	IDD	0.182	0.190	0.198	A	V_{DD} =3.3V、L0 pattern Ta=25℃ fv=60Hz
Inrush current	I_{RUSH}	-	-	1.50	A	Note (2)

Note (1): V_{DD}.dip condition:

When VDD operating within 2.7V≦VDD<3.0V、td≦10ms , the display may momentarily become abnormal.

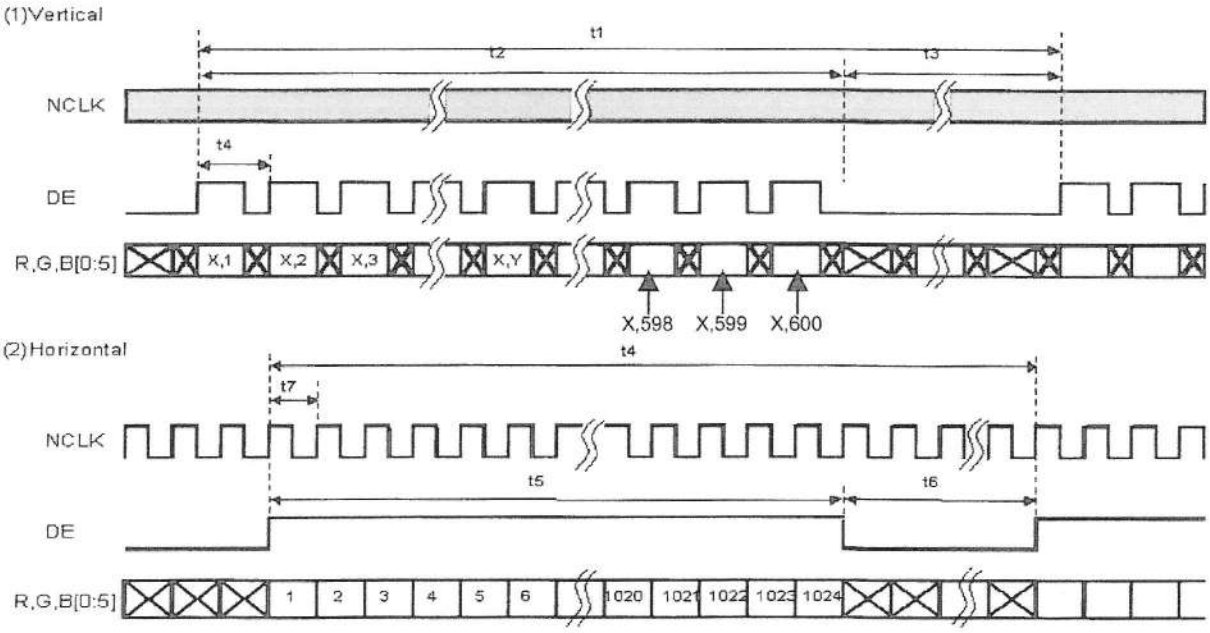
VDD<2.7V , VDD dip condition should also follow the Power On/Off conditions for supply voltage.



6.4 Interface Timing (DE mode)

Item	Symbol	Min.	Typ.	Max.	Unit
Frame Rate	--	55	60	65	Hz
Frame Period	t1	612	625	680	line
Vertical Display Time	t2	600	600	600	line
Vertical Blanking Time	t3	12	25	80	line
1 Line Scanning Time	t4	1160	1200	1510	clock
Horizontal Display Time	t5	1024	1024	1024	clock
Horizontal Blanking Time	t6	136	176	486	clock
Clock Rate	t7	39	45	61.6	MHz

Timing Diagram of Interface Signal (DE mode)



6.6 Backlight Unit

Parameter	Symbol	Min	Typ	Max	Units	Condition
LED Current	I_F	--	20	21	mA	Ta=25℃
LED Voltage	V_F	3.0	3.2	3.4	Volt	Ta=25℃
LED Power consumption	P_{LED}	--	2.12	2.36	Watt	Ta=25℃ Note (1)
LED Life-Time	N/A	10,000	--	--	Hour	Ta=25℃ I_F=18mA Note (2)

Note (1): Calculator value for reference $P=I_F \times V_F \times N$ (LED Qty')

Note (2): The LED lifetime defines as the estimated time to 50% degradation of final luminous.

6.7 LED Driver

6.7.1 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Note
LED Power Supply voltage	V_{LED}	-0.3	6	Volt	
LED_EN, PWM pin Voltage	V_{EN}, V_{PWM}	--	5.5	Volt	

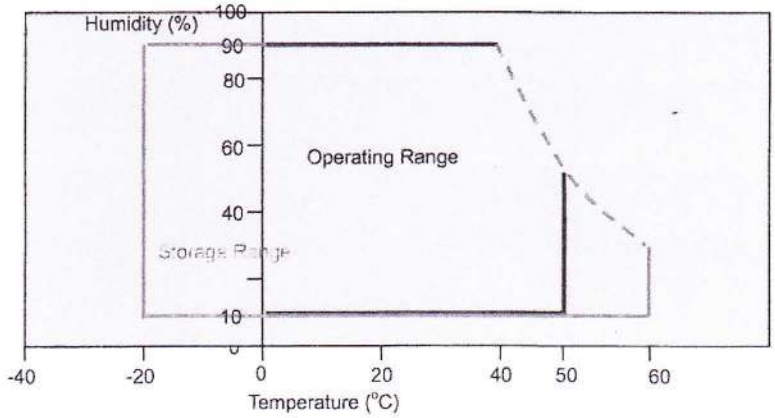
6.7.2 DC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Remark
LED Power Supply Voltage	V_{LED}	4.5	--	5.5	Volt	
PWM High Threshold	V_{PWMH}	3.0	--	--	Volt	
PWM Low Threshold	V_{PWML}	--	--	0.2	Volt	
PWM Frequency	F_{PWM}	18	--	50	KHz	
PWM Duty Cycle	T_D	15	--	--	%	Note(1)

7.0 Reliability test items

No.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+60°C, 240hrs	
2	Low Temperature Storage	Ta=-20°C, 240hrs	
3	High Temperature Operation	Ta=+50°C, 500hrs	
4	Low Temperature Operation	Ta=0°C, 500hrs	
5	Thermal Cycling Test (non operation)	-20°C(30min)→+60°C(30min),100 cycles	
6	Vibration	Sine Wave 1.5G, 5~500Hz, XYZ 30min/each direction	
7	Shock	Half-Sine, 200G, 2ms, ±XYZ, 1time	

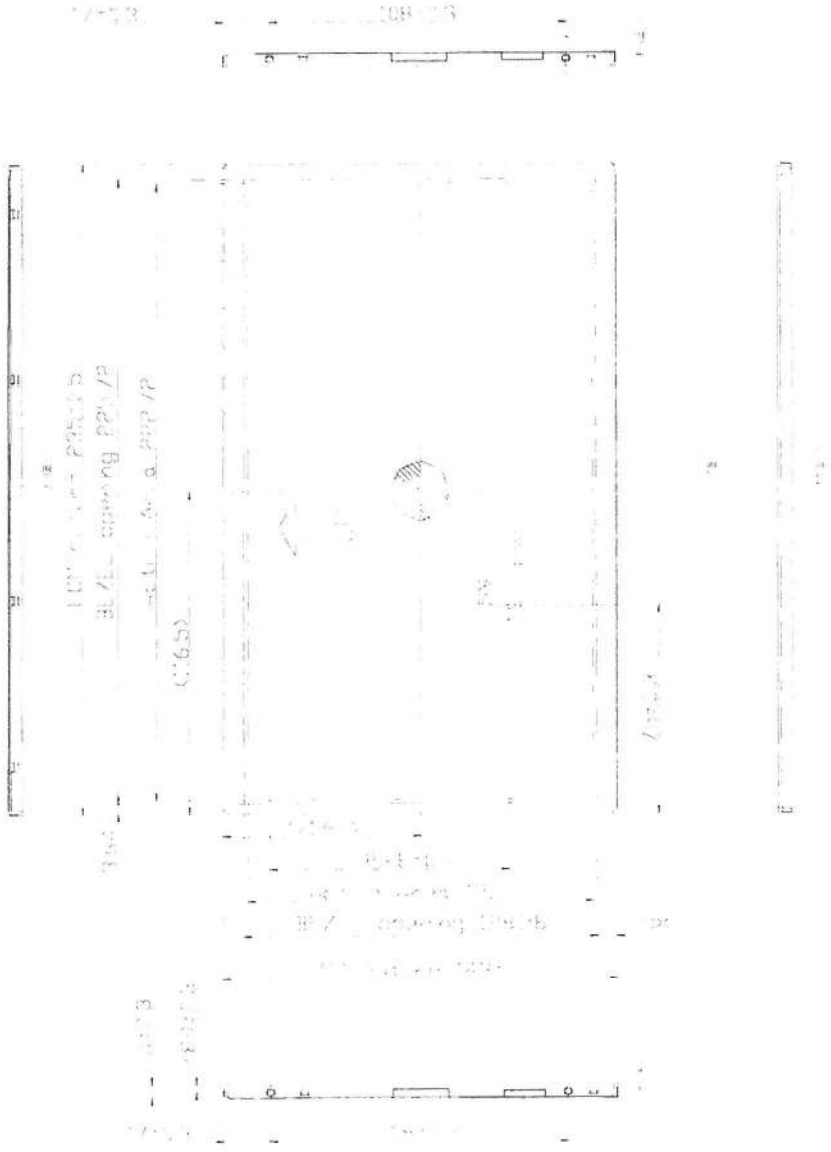
Storage / Operating temperature

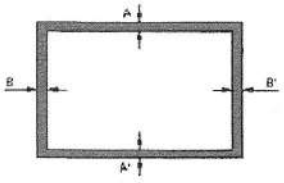


Note .Max wet bulb temp.=39°C

8.0 OUTLINE DIMENSION

8.1 Front View Outline Dimension





BM Assembly Tolerance

| A-A' | ≤ 1 (mm)

| B-B' | ≤ 1 (mm)

8.2 Back View Outline Dimension