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Date : Mar,04, 2009

Customer Acceptance Specification

Model : HSD100IFW1



Proposed by: Technical Service Division

Signature

Date

- Note:1. Please contact HannStar Display Corp. before designing your product based on this module specification.
 - 2. 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.



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Record of Revisions						
Rev.	Date	Sub-Model	Description of change			
1.0	Mar,04,2009	-	Preliminary Product Specification was first released.			
			jxicd.com			

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2.0

General description

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1.0 GENERAL DESCRIPTION

1.1 Introduction

HannStar Display model HSD100IFW1-A 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 (17:10) inch diagonally measured active display area with WSVGA (1024 horizontal by 600 vertical pixel) resolution.

1.2 Features

- 10.1 (17:10 diagonal) inch configuration
- One channel LVDS interface
- 262K color by 6 bit R.G.B signal input
- RoHS / Halogen Free Compliance

1.3 Applications

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

1.4 General information

lte	em	Specification	
Outline Dimension	on 🔪	235 x 145.8 x 5.5 (Typ.)	mm
Display area		220.416(H) x 129.15(V)	mm
Number of Pixel		1024 RGB (H) x 600(V)	pixels
Pixel pitch		0.21525(H) x 0.21525(V)	mm
Pixel arrangeme	Pixel arrangement RGB Vertical stripe		
Display mode Normally white		Normally white	
Surface treatmer	nt	Antiglare, Hard-Coating (3H) with EWV film	
Weight		253 (Typ.)	
Back-light		Single LED (Side-Light type)	
Power	Logic System	1.1 (Max.)	W
Consumption	B/L System	3.1 (Max.)	W

1.5 Mechanical Information

Item		Тур.	Max.	Unit
Horizontal (H)	234.5	235	235.5	mm
Vertical (V)	145.3	145.8	146.3	mm
Depth (D)	_	5.5	5.8	mm
	_	253	270	g
	Item Horizontal (H) Vertical (V) Depth (D)	ItemMin.Horizontal (H)234.5Vertical (V)145.3Depth (D)	Item Min. Typ. Horizontal (H) 234.5 235 Vertical (V) 145.3 145.8 Depth (D) - 5.5 - 253	Item Min. Typ. Max. Horizontal (H) 234.5 235 235.5 Vertical (V) 145.3 145.8 146.3 Depth (D) - 5.5 5.8 - 253 270



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2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit	Note
LED Power Supply voltage	V_{LED}	-0.3	6.0	V	GND=0
Logic Supply voltage	V_{DD}	-0.3	6.0	V	

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T _{opa}	0	50	°C	
Storage Temperature	T _{stg}	-20	60	°C	





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3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item		Symbol	Condition	Min.	Тур.	Max.	Unit	Note	
Contrast		CR		400	500	_		(1)(2)	
Response	Rising	T _R			5	7		(1)(0)	
time	Falling	T _F	⊖=0	_	20	28	msec	(1)(3)	
White luminance (Center)		YL	Normal viewing	200	250	_	cd/m ²	(1)(4) (I _L =200mA)	
Color	Color hromaticity White CIE1931)		angle	0.260	0.310	0.360			
chromaticity (CIE1931)				0.280	0.330	0.380			
		θL		60	70	_		(1)(4)	
Viewing	Hor.	θR		60	70	_		(1)(4)	
angle		θu	CR>10	40	50	_			
	ver.	θD		50	_60	_			
Brightness uniformity		BUN	0=0	70			~~~	(5)	
Optima View Direction		WW.		60'	clock			(6)	

3.2 Measuring Condition

- Measuring surrounding : dark room
- LED current I_L: 200mA
- Ambient temperature : 25±2°C
- 15min. warm-up time.



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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:



Luminance with all pixels white

CR = -

Luminance with all pixels black





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4.3 Relationship Between Displayed Color and Input

		MSF	3			LSE	3 M	SB				SB	MS	B				SB	Grav scale
	Display	R5	 R4	R3	R2	R1	R0 G	<u>5 G4</u>	G3	G2	G1	GO	B5	B4	Β3	Β2	B1	B0	level
	Black	L	L	L	L	L	LL	L	L	L	L	L	L	L	L	L	L	L	-
	Blue	L	L	L	L	L	LL	L	L	L	L	L	Н	Н	Н	Н	Н	Н	-
	Green	L	L	L	L	L	LH	Н	Н	Н	Н	Н	L	L	L	L	L	L	-
Basic	Light Blue	L	L	L	L	L	LH	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	-
color	Red	Н	Н	Н	Н	Н	HL	L	L	L	L	L	L	L	L	L	L	L	-
	Purple	Н	Н	Н	Н	Н	HL	L	L	L	L	L	Н	Н	Н	Н	Н	Н	-
	Yellow	Н	Н	Н	Н	Н	HH	Н	Н	Н	Н	Н	L	L	L	L	L	L	-
	White	Н	Н	Н	Н	Н	ΗH	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	-
	Black	L	L	L	L	L	LL	L	L	L	L	L	L	L	L	L	L	L	L0
		L	L	L	L	L	ΗL	L	L	L	L	L	L	L	L	L	L	L	L1
		L	L	L	L	Н	LL	L	L	L	L	L	L	L	L	L	L	L	L2
Gray scale of Red	Dark ↑ ↓ Light				:				:							:			L3L60
		Н	Н	Н	Н	L	ΗL	L	L	L	L	L	L	L	L	L	L	L	L61
		Н	Н	Н	Н	Н	LL	L	L	L	L	L	L	L	L	L	L	L	L62
	Red	Н	Н	Н	Н	Н	ΗL	L	L	L	L	L	L	L	L	L	L	L	Red L63
	Black	L	L	L	L	L	LL	L	L	L	L	L	L	L	L	L	L	L	L0
		L	L	L	L	L	LL	L_	L	L	L	Н	L	L	L	L	L	L	L1
		L	L	L	L	L	UL	L	L	L	H	L	L	L	L	L	L	L	L2
Gray scale of Green	Dark ↓ Light					/.		X				•					η		L3L60
	-	1	1	1	1	1	ТН	н	н	н	1	н	1	1	1	1	1	T	1.61
		1	1	1	<u> </u>	<u> </u>	<u> </u>	<u>н</u>	<u> </u>	H	<u>– –</u>		<u> </u>	1	<u> </u>	1	1	L L	1.62
	Green	1	1	-		-	I H	H	н	H	н	H	-	1	1		<u> </u>	-	Green I 63
	Black	1					11	1	1	1	1	1	-	1	- -		ī	1	10
		L	L	L	L	L	LL	L	L	L	L	L	L	L	L	L	L	H	L1
		Ĺ	L	L	L	L	LL	L	L	L	L	L	L	L	L	L	H	L	L2
	Dark																		
Gray scale of Blue	Dark ↑ ↓ Light				:				:							:			L3L60
		L	L	L	L	L	LL	L	L	L	L	L	Н	Н	Н	Н	L	Н	L61
		L	L	L	L	L	LL	L	L	L	L	L	Н	Н	Н	Н	Н	L	L62
	Blue	L	L	L	L	L	LL	L	L	L	L	L	Н	Н	Н	Н	Н	Н	Blue L63
	Black	L	L	L	L	L	LL	L	L	L	L	L	L	L	L	L	L	L	LO
		L	L	L	L	L	ΗL	L	L	L	L	Η	L	L	L	L	L	Н	L1
		L	L	L	L	Н	LL	L	L	L	Η	L	L	L	L	L	Н	L	L2
Gray scale of White & Black	Dark ↑ ↓ Light				:				:							:			L3L60
		Н	Н	Η	Н	L	ΗH	Н	Н	Н	L	Н	Н	Н	Н	Н	L	Н	L61
		Н	H	Н	Н	Н	LH	Н	H	Н	Н	L	Н	Н	Н	Н	Н	L	L62
	White	Н	Н	Η	Η	Η	ΗH	Н	Н	Н	Η	Η	Н	Н	Н	Η	Η	Н	White L63



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5.0 INTERFACE PIN CONNECTION 5.1 TFT LCD Module : CN1 (Input signal): FI-XB30SL-HF10 (JAE or equivalent) Pin No. Description Signal **GND** Ground 1 2 VDD 3.3V Power 3 VDD 3.3V Power 4 3.3V Power for EDID V_EDID 5 Adjust for LED brightness ADJ Note EDID Clock Input 6 CLK_EDID 7 DATA_EDID EDID Data Input 8 RXIN0-LVDS Signal channel0-9 RXIN0+ LVDS Signal+ channel0+ 10 GND Ground 11 RXIN1-Data Input channel1-12 RXIN1+ channel1+ Data Input GND Ground 13 RXIN2-14 Data Input channel2-15 RXIN2+__ Data Input channel2+ Ground 16 GND 17 RXCLKIN- Data Input CLK-18 RXCLKIN+ Data Input CLK+ 19 GND Ground 20 NC NC NC NC 21 22 GND Ground 23 **GND** Ground VLED LED Power +5V 24 25 LED Power +5V VLED LED Power +5V 26 VLED 27 NC NC NC NC 28 NC NC 29 NC NC 30 Note : The brightness of LCD panel could be changed by adjusting ADJ



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[Note]

(1) ADJ can adjust brightness to control Pin. Pulse duty the bigger the brighter.



(2) ADJ Signal=0~3.3V , Operation Frequency :





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6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

	-					
Item	Symbol	Min.	Тур.	Max.	Unit	Note
	V _{DD}	3.0	3.3	3.6	V	Note (2)
	V_{LED}	4.7	5.0	5.3	V	
Current of power supply	IDD	-	0.3	-	А	V _{DD} =3.3V \ L0 pattern

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

When VDD operating within 2.7V \leq VDD<3.0V \cdot td \leq 10ms , the display may momentarily become abnormal.

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





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6.2 Switching Characteristics for LVDS Receiver

Item	Symbol	Min.	Тур.	Max.	Unit	Conditions
Differential Input High Threshold	Vth		_	100	mV	V -1 2V
Differential Input Low Threshold	Vtl	-100	_	_	mV	V _{CM} =1.2V
Input Current	I _{IN}	-10	_	+10	uA	
Differential input Voltage	IV _{ID} I	0.1	_	0.6	V	
Common Mode Voltage Offset	V _{CM}	(IV _{ID} I/2)	1.25	1.8-0.4-(IV _{ID} I/2)	V	

6.3 Bit Mapping & Interface Definition



LVDS Receiver Input Timing Definition for 6bits LVDS input



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6.4 Interface Timing (DE mode)

Item	Symbol	Min.	Тур.	Max.	Unit
Frame Rate		55	60	65	Hz
Frame Period	t1	612	625	638	line
Vertical Display Time	t2	600	600	600	line
Vertical Blanking Time	t3	12	25	38	line
1 Line Scanning Time	t4	1160	1200	1240	clock
Horizontal Display Time	t5	1024	1024	1024	clock
Horizontal Blanking Time	t6	136	176	216	clock
Clock Rate	t7	39	45	51.42	MHz

Timing Diagram of Interface Signal (DE mode)



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- Note : (1) The supply voltage of the external system for the module input should be the same as the definition of V_{DD} .
 - (2) Apply the lamp volatge within the LCD operation range. When the back-light turns on before the LCD operation or the LCD truns off before the back-light turns off, the display may momentarily become white.
 - (3) In case of VDD = off level, please keep the level of input signal on the low or keep a high impedance.
 - (4) TP4 should be measured after the module has been fully discharged between power off and on period.
 - (5) Interface signal shall not be kept at high impedance when the power is on.

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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	High Temperature and High Humidity (operation)	Ta=+50°C, 80%RH, 500hrs	
6	Thermal Cycling Test (non operation)	$-20^{\circ}C(30min) \rightarrow +60^{\circ}C(30min), 100 \text{ cycles}$	
7	Electrostatic Discharge	±200V,200pF(0Ω) 1 time/connector	
8	Vibration	1.Random: 1.04G, 10~500Hz, XYZ, 30min/each direction	
		2.Sine: 1.5G, 5~500Hz, XYZ 30min/each direction	
9	Shock	Half-Sine, 220G, 2ms, ±XYZ, 1time	
10	Vibration (with carton)	Random: 1.04G, 10~500Hz, XYZ, 45min/each direction	
11	Drop (with carton)	Height: 60 cm	JIS Z020

before the reliability stress.



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9.0 LOT MARK

9.1 Lot Mark



Code 1,2,3,4,5,6: HannStar internal flow control code.

Code 7: production location.

Code 8: production year.

Code 9: production month.

Code 10,11,12,13,14,15: serial number.

Note (1) Production Year: Code 8 is defined by the last number of the year, for example

	Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	Mark	1	2	3	4	5	6	7	8	9	0
N	Note (2) Production Month										

Note (2) Production Month

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	В	С
9.2 Detail of	Lot N	lark		X		ا لر						

9.2 Detail of Lot Mark

- (1) Below label is attached on the backside of the LCD module. See Section 8.0: Outline Dimension.
- (2) The detail of Lot Mark is attached as below.
- (3) This is subject to change without prior notice.





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10.0 PACKAGE SPECIFICATION

10.1 Packing form

- (1) Package quantity in one carton: 50 pieces.
- (2) Carton size: 460 mmx361 mmx321 mm.

10.2 Packing assembly drawings



	Material	Notice
Box	Corrugated Paper Board	(AB Flute)
Partition/Pad	Corrugated Paper Board	(B Flute)
Corner Pad	Corrugated Paper Board	(AB Flute)
ESD bag	PE	



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11.0 GENERAL PRECAUTION

11.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

11.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. HannStar does not warrant the module, if customers disassemble or modify the module.

11.3 Breakage of LCD Panel

- 11.3.1.If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.
- 11.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.
- 11.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
- 11.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

11.4 Electric Shock

- 11.4.1. Disconnect power supply before handling LCD module.
- 11.4.2. Do not pull or fold the LED cable.
- 11.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

11.5 Absolute Maximum Ratings and Power Protection Circuit

- 11.5.1. Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.
- 11.5.2. Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- 11.5.3. It's recommended to employ protection circuit for power supply.



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11.6 Operation

- 11.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.
- 11.6.2 Use fingerstalls of soft gloves in order to keep clean display guality, when persons handle the LCD module for incoming inspection or assembly.
- 11.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
- 11.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.
- 11.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

11.7 Mechanism

Please mount LCD module by using mounting holes arranged in four corners tightly.

11.8 Static Electricity

- 11.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.
- 11.8.2 Because LCD module use CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge.

Persons who handle the module should be grounded through adequate methods.

11.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

11.10 Disposal

When disposing LCD module, obey the local environmental regulations.