



SPECIFICATION



HSD101GWW7-90000D-PX

10.1" - WXGA - MIPI

Version: 1.0

Date: 05.01.2024

Note: This specification is subject to change without prior notice

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	1/23
Document No.		Revision	1.0

TO :

Date : 2024/01/05

HannStar Product Specification

(Preliminary)

10.1” Color TFT-LCD Module

Model: **HSD101GWW7-90000D-PX**

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.



Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	2/23
Document No.		Revision	1.0

Record of Revisions

Rev.	Date	Sub-Model	Description of change
1.0	2024/01/05	90000D-PX	Preliminary Product Specification was first released

The information contained in this document is the exclusive property of HannStar Display Corporation. It shall not be disclosed, distributed or reproduced in whole or in part without written permission of HannStar Display Corporation.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	3/23
Document No.		Revision	1.0

Contents

1.0	GENERAL DESCRIPTION	4
2.0	ABSOLUTE MAXIMUM RATINGS	5
3.0	OPTICAL CHARACTERISTICS	6
4.0	BLOCK DIAGRAM	10
5.0	INTERFACE PIN CONNECTION	11
6.0	ELECTRICAL CHARACTERISTICS	12
7.0	RELIABILTY TEST ITEMS	18
8.0	OUTLINE DIMENSION	19
9.0	LOT MARK	20
10.0	PACKAGE SPECIFICATION	21
11.0	GENERAL PRECAUTION	22

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	4/23
Document No.		Revision	1.0

1.0 GENERAL DESCRIPTION

1.1 Introduction

HannStar Display model HSD101GWW7-90000D-PX 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(10:16) inch diagonally measured active display area with 800x1280 (800 horizontal by 1280 vertical pixel) resolution.

1.2 Features

- 10.1 inch configuration
- 16.7M color by 8 bits R.G.B.
- ROHS / Halogen Free Compliance

1.3 General information

Item	Specification	Unit	
Outline Dimension(LCM)	143.0(H) x 228.6(V) x 2.6(D)	mm	
Display area	135.36 (H) x216.58 (V)	mm	
Number of Pixel	800 RGB (H) x1280 (V)	pixels	
Pixel pitch	0.1692(H) x 0.1692(V)	mm	
Pixel arrangement	RGB Vertical Stripe	--	
Display mode	Normally Black	--	
Display Interface	MIPI	--	
Surface treatment	HC	--	
Weight	(173)(Typ.)	g	
Power Consumption	Logic System (White Pattern)	(1.056) (typ.)	W
	B/L System	(3) (typ.)	W

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	5/23
Document No.		Revision	1.0

2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Analog Supply voltage	VCC	-0.3	3.6	V	GND=0
Logic Input voltage	Vin	-0.3	VCC+0.3	V	GND=0

Note (1):

Permanent damage may occur to the LCD module if beyond this specification.

Functional operation should be restricted to the conditions described under normal operating conditions.

Note (2):

Ta =25±2°C

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T _{opa}	-20	70	°C	(3),(4)
Storage Temperature	T _{stg}	-30	80	°C	(3),(4)

Note (3):

If Ta below 50°C, the maximal humidity is 90%RH, if Ta over 50°C, absolute humidity should be less than 60%RH.

Note (4):

The response time will be extremely slow when the operating temperature is around -10°C, and the back ground will become darker at high temperature operating.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	6/23
Document No.		Revision	1.0

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Contrast	CR	$\Theta=0$ Normal viewing angle	800	1000	--	--	(1)(2)	
Response time	Tr+Tf		--	30	40	msec	(1)(3)	
White luminance (Center)	Y_L				700	--	cd/m ²	(1)(4)
Color Gamut	S(%)		--	(57)	--	%		
Color chromaticity (CIE1931)	White	W_x		(0.330)			(1)(4)	
		W_y		(0.360)				
	Red	R_x		(0.620)				
		R_y		(0.340)				
	Green	G_x		(0.380)				
		G_y		(0.560)				
Blue	B_x		(0.140)					
	B_y		(0.100)					
Viewing angle	Hor.	Θ_L	--	80	--			
		Θ_R	--	80	--			
	Ver.	Θ_U	--	80	--			
		Θ_D	--	80	--			
Brightness Uniformity	B_{UNI}	$\Theta=0$	(75)	--	--		(5)	
Optima View Direction	ALL							

3.2 Measuring Condition

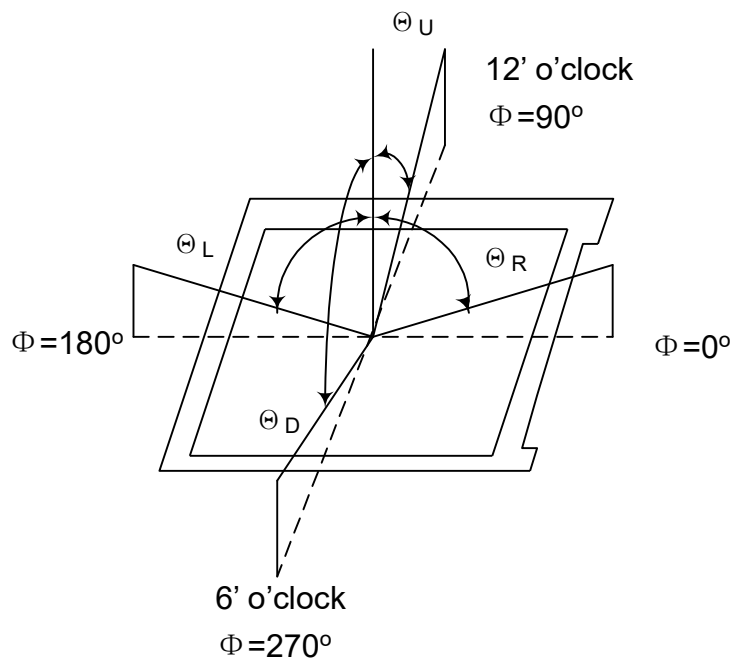
- Measuring surrounding: dark room
- Ambient temperature: 25±2°C
- 15min. warm-up time.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	7/23
Document No.		Revision	1.0

3.3 Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-7 for other optical characteristics.
- Measuring spot size: 20 ~ 21 mm

Note (1) Definition of Viewing Angle:



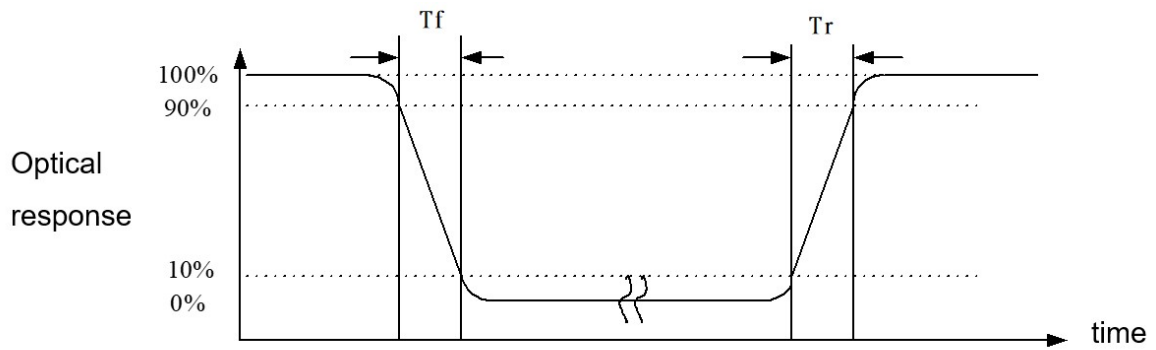
Note (2) Definition of Contrast Ratio (CR) :

measured at the center point of panel

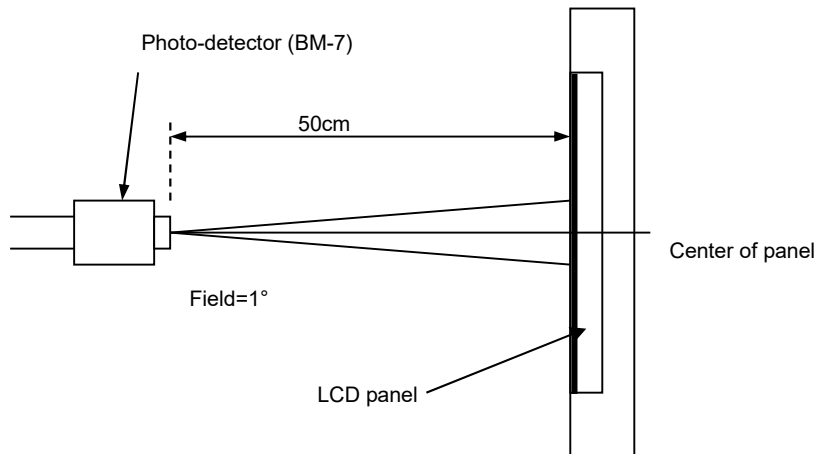
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	8/23
Document No.		Revision	1.0

Note (3) Definition of Response Time : Sum of T_r and T_f

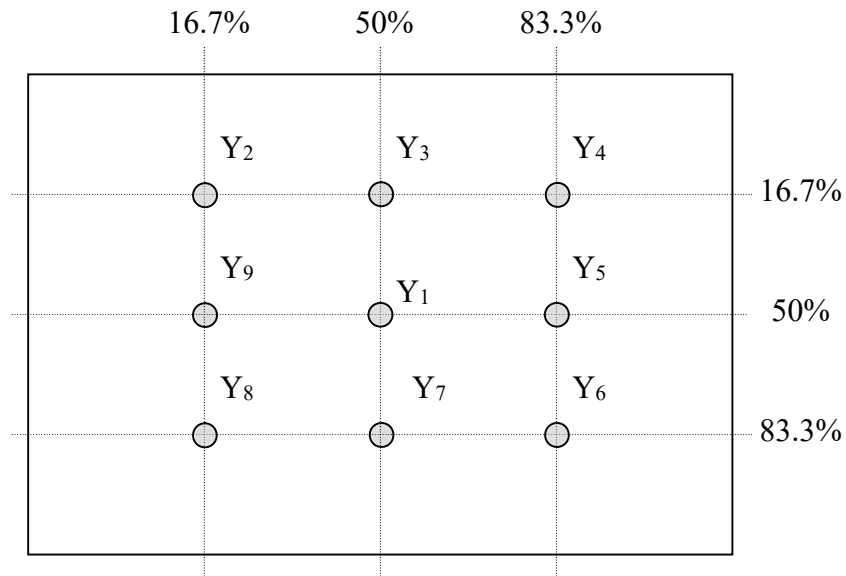


Note (4) Definition of optical measurement setup



Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	9/23
Document No.		Revision	1.0

Note (5) Definition of brightness uniformity

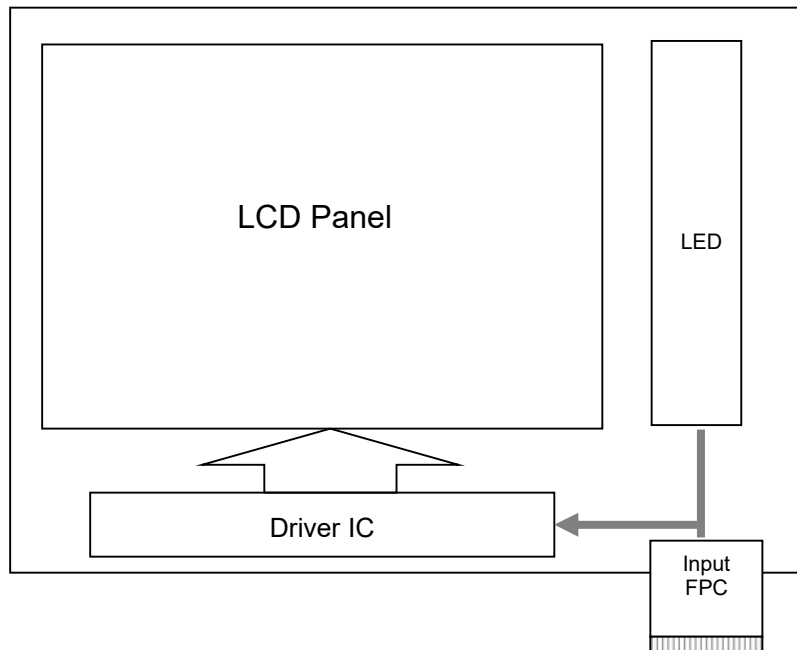


$$\text{Luminance uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

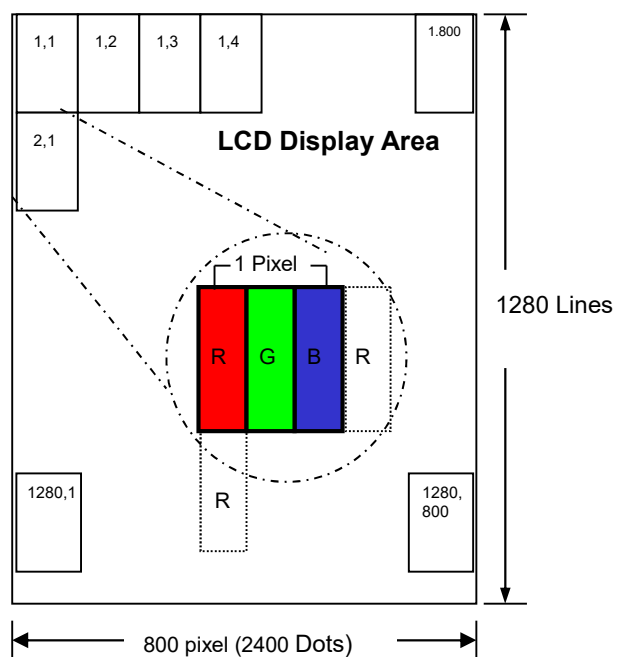
Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	10/23
Document No.		Revision	1.0

4.0 BLOCK DIAGRAM

4.1 TFT LCD Module



4.2 Pixel Format



Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	11/23
Document No.		Revision	1.0

5.0 INTERFACE PIN CONNECTION

5.1 LCM Pin Assignment

The used connector: FH34SRJ-40S-0.5SH(50) manufactured by HIROSE

NO.	Symbol	Description
1	NC	Not connect
2-3	VDD3.3V	Power supply(3.3V)
4	GND	Ground
5	RESET	Reset signal pin(1.8V)
6	NC	Not connect
7	GND	Ground
8	MIPI_D0-	Negative polarity of low voltage differential data signal
9	MIPI_D0+	Positive polarity of low voltage differential data signal
10	GND	Ground
11	MIPI_D1-	Negative polarity of low voltage differential data signal
12	MIPI_D1+	Positive polarity of low voltage differential data signal
13	GND	Ground
14	MIPI_CLK-	Negative polarity of low voltage differential clock signal
15	MIPI_CLK+	Positive polarity of low voltage differential clock signal
16	GND	Ground
17	MIPI_D2-	Negative polarity of low voltage differential data signal
18	MIPI_D2+	Positive polarity of low voltage differential data signal
19	GND	Ground
20	MIPI_D3-	Negative polarity of low voltage differential data signal
21	MIPI_D3+	Positive polarity of low voltage differential data signal
22	GND	Ground
23-24	NC	Not connect
25	GND	Ground
26-29	NC	Not connect
30	GND	Ground
31-32	LEDK-	LED Cathode.
33-38	NC	Not connect
39-40	LEDA+	LED Anode.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	12/23
Document No.		Revision	1.0

6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

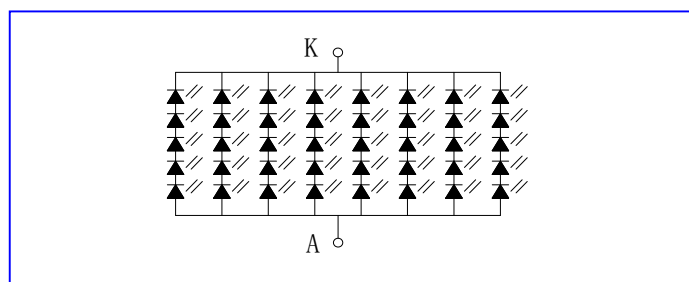
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage	VCC	3.0	3.3	3.6	V	
supply current	I _{VCC}	-	(320)	(350)	mA	VCC=3.3V
Logic input voltage (RESET)	V _{IH}	0.7*IOVCC	-	IOVCC	V	IOVCC is internal voltage =1.8V
	V _{IL}	GND	-	0.3*IOVCC	V	

6.2 Backlight Unit

Parameter	Symbol	Min	Typ	Max	Units	Condition
LED Light-Bar Current	I _{LEDA}	--	200	--	mA	Ta=25°C
LED Light-Bar LED Voltage	V _{LEDA}	13	15	17	Volt	Ta=25°C
LED Life-Time	N/A	50,000	--	--	Hour	Ta=25°C Note (2)

Note (1) The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C. and LED typical current. The LED lifetime could be decreased if operating I_{LEDA} is larger than LED typical current. The constant current driving method is suggested.

Note (2) LED light bar circuit :



LED CIRCUIT DIAGRAM
V_{LEDA}=13~17V (I_{LEDA}=200mA)

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	13/23
Document No.		Revision	1.0

6.3 Interface Characteristics

6.3.1 DC characteristics for interface

Parameter	Symbol	Condition	Specification			Unit
Input Common Mode Voltage for Clock	V_{CMCLK}	CLKP/N Note 2, Note 3	70	-	330	mV
Input Common Mode Voltage for Data	V_{CMDATA}	DnP/N Note 2, Note 3, Note 5	70	-	330	mV
Common Mode Ripple for Clock Equal or Less than 450MHz	$V_{CMRCLK450}$	CLKP/N Note 4	-50	-	50	mV
Common Mode Ripple for Data Equal or Less than 450MHz	$V_{CMRDATAL450}$	DnP/N Note 4, Note 5	-50	-	50	mV
Common Mode Ripple for Clock More than 450MHz (peak sine wave)	$V_{CMRCLKM450}$	CLKP/N	-	-	100	mV
Common Mode Ripple for Data More than 450MHz (peak sine wave)	$V_{CMRDATAM450}$	DnP/N Note 5	-	-	100	mV
Differential Input Low Level Threshold Voltage for Clock	V_{THCLK-}	CLKP/N	-70	-	-	mV
Differential Input Low Level Threshold Voltage for Data	$V_{THDATA-}$	DnP/N Note 5	-70	-	-	mV
Differential Input High Level Threshold Voltage for Clock	V_{THCLK+}	CLKP/N	-	-	70	mV
Differential Input High Level Threshold Voltage for Data	$V_{THDATA+}$	DnP/N Note 5	-	-	70	mV
Single-ended Input Low Voltage	V_{ILHS}	CLKP/N, DnP/N Note 3, Note 5	-40	-	-	mV
Single-ended Input High Voltage	V_{IHHS}	CLKP/N, DnP/N Note 3, Note 5	-	-	460	mV
Differential Termination Resistor	R_{TERM}	CLKP/N, DnP/N Note 5	80	100	125	Ω
Single-ended Threshold Voltage for Termination Enable	V_{TERMEN}	CLKP/N, DnP/N Note 5	-	-	450	mV
Termination Capacitor	C_{TERM}	CLKP/N, DnP/N Note 5, Note 6	-	-	60	pF

Notes:

1. $T_a = -30^{\circ}\text{C}$ to 70°C (to $+85^{\circ}\text{C}$ no damage), $V_{CI} = 2.5\text{V}$ to 6.6V , $V_{DDI} = 1.65\text{V}$ to 3.6V
2. Includes 50mV (-50mV to 50mV) ground difference
3. Without $V_{CMRCLK450}/V_{CMRDATAM450}$
4. Without 50mV (-50mV to 50mV) ground difference
5. $n = 0$ and 1
6. For higher bit rates, a 14pF capacitor will be needed to meet the common-mode return loss specification.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	14/23
Document No.		Revision	1.0

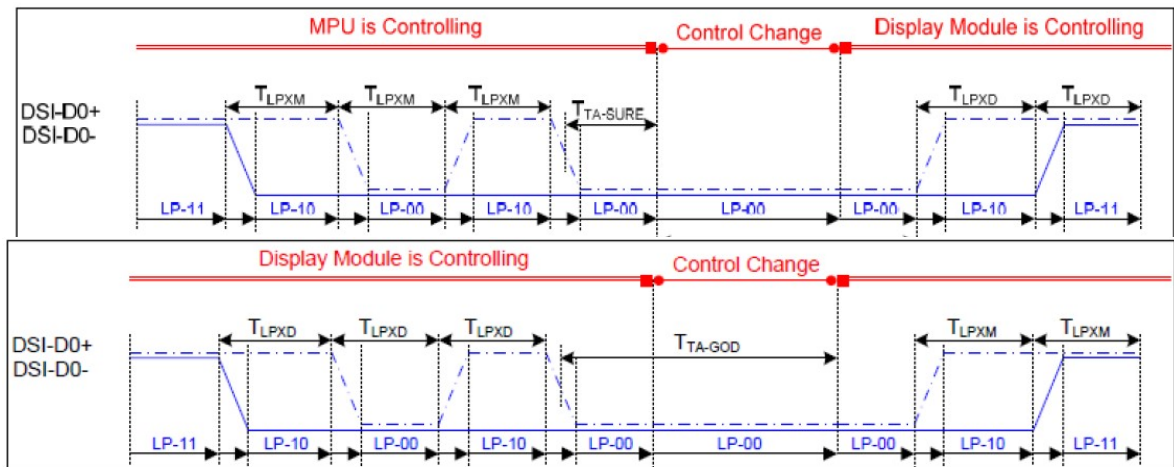
6.3.2 AC characteristics for interface

6.3.2.1 DSI HS mode

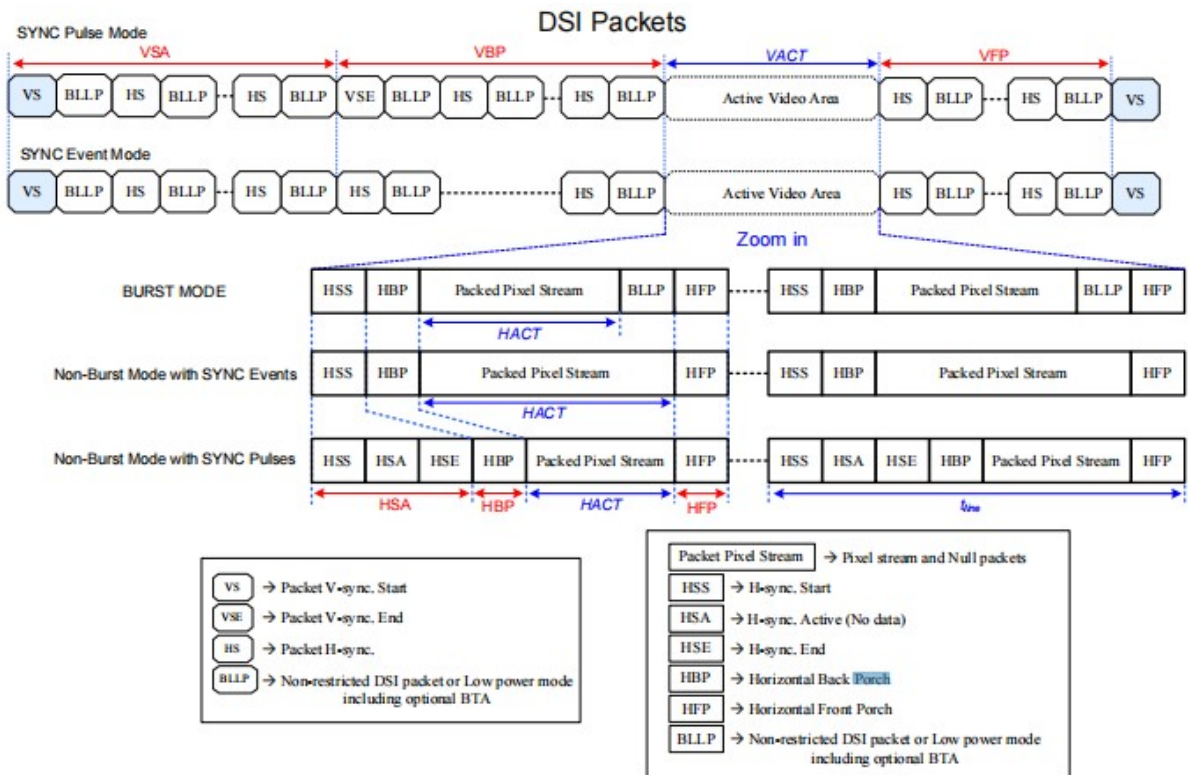


Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-CLK+/-	$2 \times UI_{INSTA}$	Double UI instantaneous	4	25	ns	
DSI-CLK+/-	UI_{INSTA} UI_{INSTB}	UI instantaneous halves	2	12.5	ns	$UI = UI_{INSTA} = UI_{INSTB}$
DSI-Dn+/-	tDS	Data to clock setup time	0.15	-	UI	
DSI-Dn+/-	tDH	Data to clock hold time	0.15	-	UI	

6.3.2.2 DSI LP mode



Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	15/23
Document No.		Revision	1.0



Parameters	Symbols	Min.	Typ.	Max.	Units
Vertical sync. active	VSA	2 (Note 4)	-	-	Line
Vertical Back Porch	VBP	14 (Note 4)	-	-	Line
Vertical Front Porch	VFP	8 (Note 4)	-	-	Line
Active lines per frame	VACT	-	1280	-	Line
Horizontal sync. active	HSA	2	-	-	Pixel
Horizontal Porch period	HSA + HBP + HFP	1.6	-	-	us
Active pixels per line	HACT	-	720	-	Pixel
Bit rate	BR _{bps}	385		Note 5	Mbps/lane

1 UI=1/Bit rate

$$HSA(\text{pixel}) = (t_{HSA} \times \text{lane number}) / (UI \times \text{pixel format})$$

$$HBP(\text{pixel}) = (t_{HBP} \times \text{lane number}) / (UI \times \text{pixel format})$$

$$HFP(\text{pixel}) = (t_{HFP} \times \text{lane number}) / (UI \times \text{pixel format})$$

$$\text{Frame Rate} = \frac{BR_{\text{bps}} \times \text{Lane}_{\text{num}}}{(VACT + VSA + VBP + VFP) \times (HACT + HSA + HBP + HFP) \times \text{Pixel Format}}$$

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	16/23
Document No.		Revision	1.0

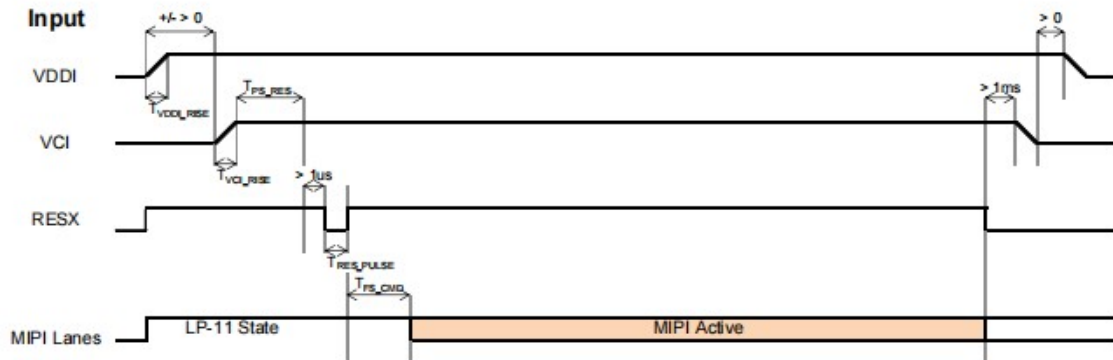
6.3.3 Input timings for interface

Item	Symbol	Value			Unit
		Min.	Typ.	Max.	
HS low pulse width	HS		6		DCK
Horizontal back porch	HBP		60		DCK
Horizontal front porch	HFP		60		DCK
Horizontal blanking period	HBLK		NA		DCK
Horizontal active area	HDISP	-	800	-	DCK
Pixel Clock	PCLK		72		MHz
Vertical low pulse width	VS		4		Line
Vertical back porch	VBP		8		Line
Vertical front porch	VFP		8		Line
Vertical blanking period	VBK		NA		Line
Vertical active area	-	-	1280	-	Line
Vertical Refresh rate	VRR	-	60	-	Hz

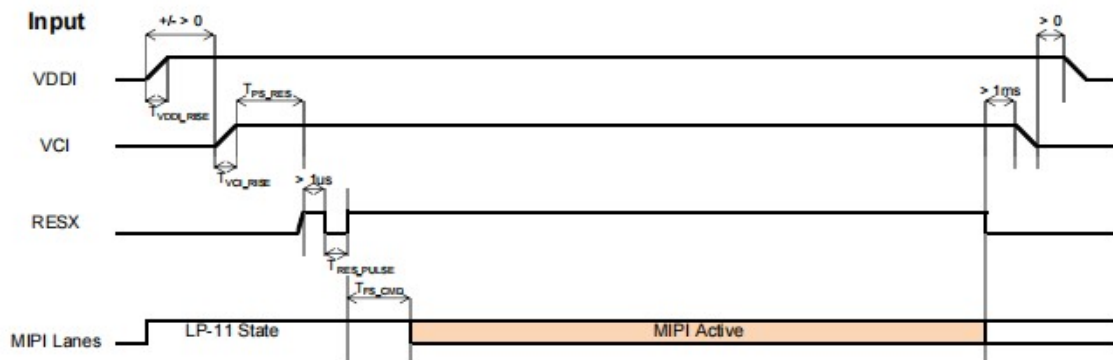
Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	17/23
Document No.		Revision	1.0

6.4 Power Sequence

Case A:



Case B:



Symbol	Characteristics	Min.	Typ.	Max.	Units
T_{VDDI_RISE}	VDDI Rise time	20	-	-	us
T_{VCI_RISE}	Case A: VCI Rise time	200	-	-	us
	Case B: VCI Rise time	40	-	-	us
T_{PS_RES}	VDDI/VCI on to Reset high	5	-	-	ms
T_{RES_PULSE}	Reset low pulse time	10	-	-	us
T_{FS_CMD}	Reset to first command	10	-	-	ms

Figure 105: Power on/off sequence with Power Mode 3

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	18/23
Document No.		Revision	1.0

7.0 RELIABILITY TEST ITEMS

No.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+80±2°C, 240hrs	1、2、3
2	Low Temperature Storage	Ta=-30±2°C, 240hrs	1、2、3
3	High Temperature Operation	Ta=70±2°C, 240hrs	1、2、3
4	Low Temperature Operation	Ta=-20±2°C, 240hrs	1、2、3
5	High Temperature and High Humidity (operation)	Ta=60±2°C, 90%RH, 240Hrs	1、2、3
6	Thermal Cycling Test (non operation)	-20°C(30min)→+70°C(30min),100 cycles	1、2、3

Note1: There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.

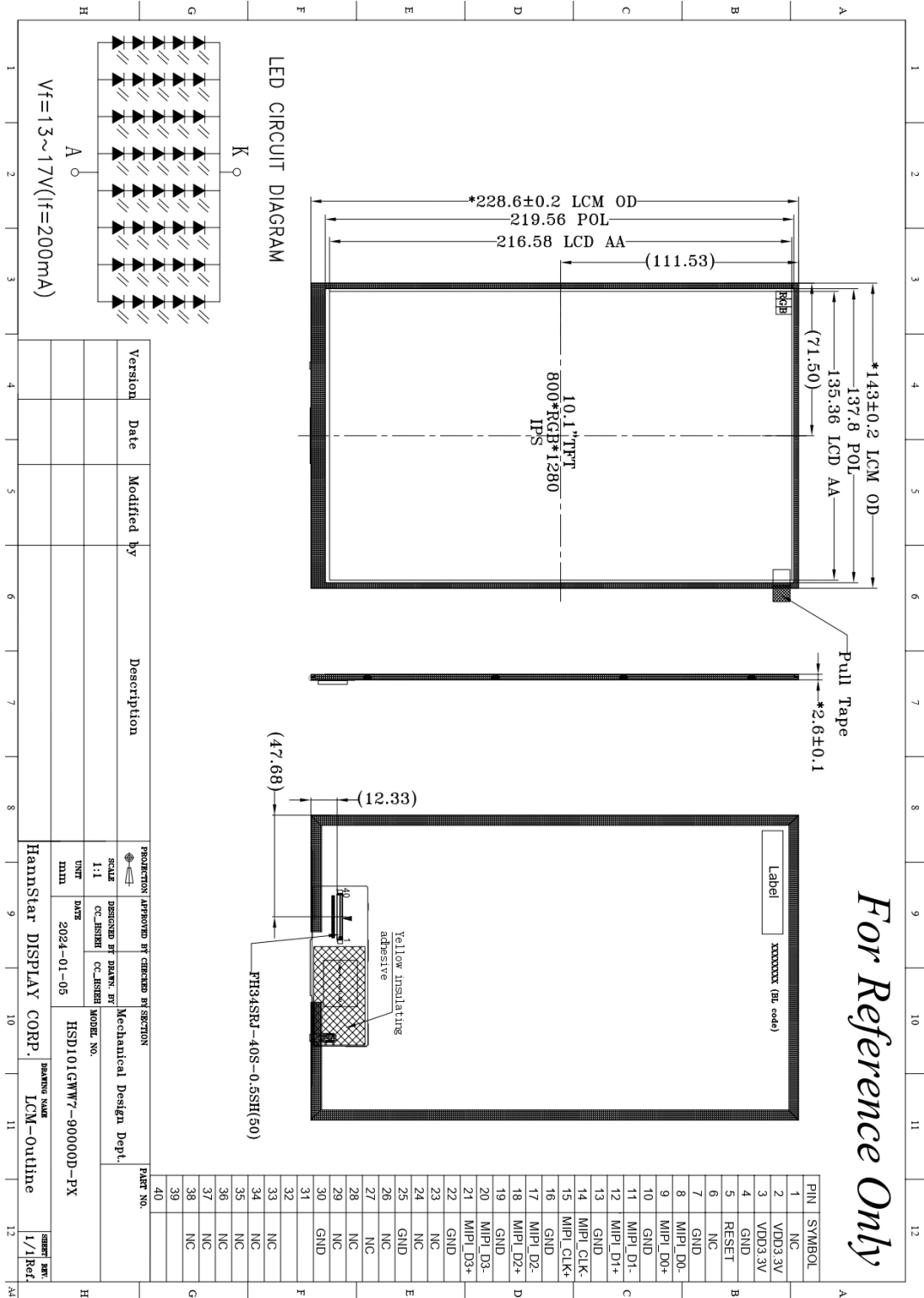
Note2: All of the function & cosmetic Judgment basis base on room temperature.
(The tested module must have enough recovery time at least 2 hours at room temperature.)

Note3: The test condition definition panel's surface temperature.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	19/23
Document No.		Revision	1.0

8.0 OUTLINE DIMENSION

Unit : mm



For Reference Only

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	20/23
Document No.		Revision	1.0

9.0 LOT MARK

9.1 Lot Mark

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----

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

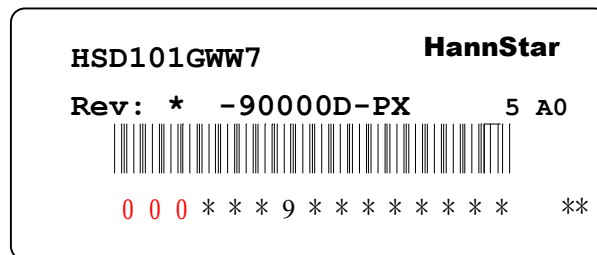
Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Mark	6	7	8	9	0	1	2	3	4	5	6

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	B	C

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.



Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	21/23
Document No.		Revision	1.0

10.0 PACKAGE SPECIFICATION

10.1 Packing form

TBD

10.2 Packing Drawing

TBD

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	22/23
Document No.		Revision	1.0

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

11.3.2. 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.

11.3.3. If liquid crystal contacts mouth or eyes, rinse out with water immediately.

11.3.4. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

11.3.5. 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.

Document Title	HSD101GWW7-90000D-PX Product Information	Page No.	23/23
Document No.		Revision	1.0

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 quality, 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.



ALL TECHNOLOGIES. ALL COMPETENCIES. ONE SPECIALIST.



DATA MODUL AG
Landsberger Straße 322
DE-80687 Munich
Phone: +49-89-56017-0

DATA MODUL WEIKERSHEIM GMBH
Lindenstraße 8
DE-97990 Weikersheim
Phone: +49-7934-101-0



More information and worldwide locations can be found at

www.data-modul.com