NHD-7.0-1024600AF-LSXP

IPS TFT Liquid Crystal Display Module

NHD-	Newhaven Display
7.0-	7.0” Diagonal
1024600-	1024xRGBx600 Pixels
AF-	Model
L-	LVDS Interface
S-	High Brightness, White LED Backlight
X-	TFT
P-	IPS, Wide Temperature

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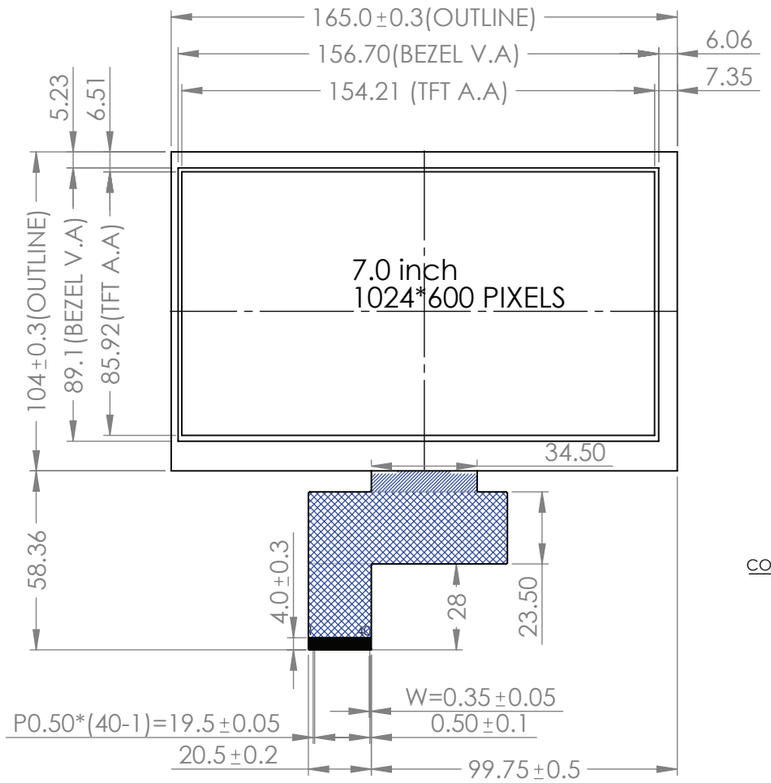
Document Revision History

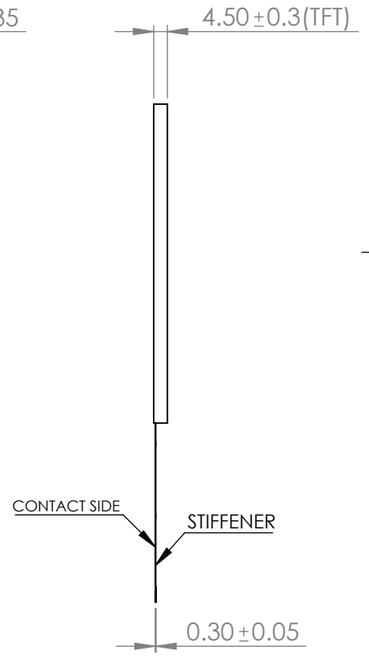
Revision	Date	Description	Changed by
-	4/22/19	Initial Release	PK

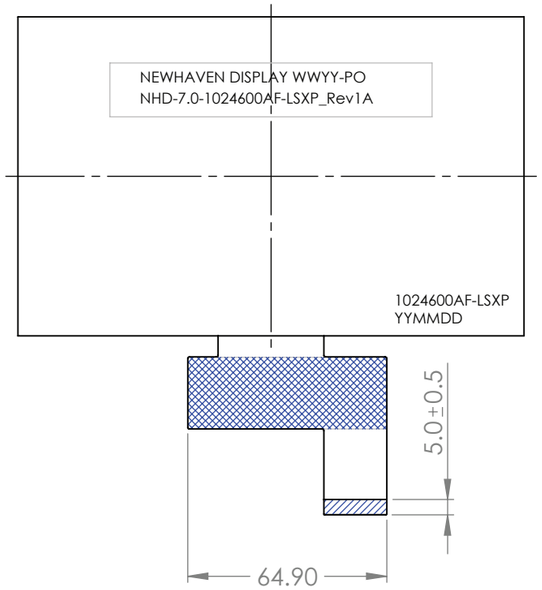
Functions and Features

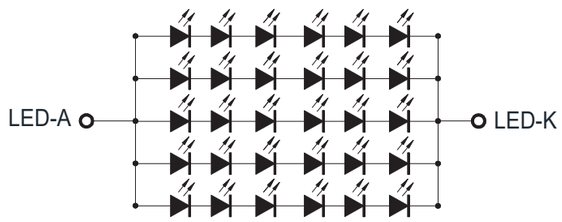
- **1024xRGBx600 Resolution**
- **IPS Type, Full Viewing Angles**
- **LED Backlight**
- **LVDS Interface**
    - **4 LVDS Channels**
- **16.7M Colors**
- **Capacitive Touch Panel available**

SYMBOL	REVISION	DATE









PIN	SYMBOL	PIN	SYMBOL
1	NC	21	Rin3+
2	VDD	22	GND
3	VDD	23	NC
4	NC	24	NC
5	/RES	25	GND
6	/STBYB	26	NC
7	GND	27	BIST
8	Rin0-	28	INSEL
9	Rin0+	29	NC
10	GND	30	GND
11	Rin1-	31	NC
12	Rin1+	32	NC
13	GND	33	SHLR
14	Rin2-	34	UPDN
15	Rin2+	35	NC
16	GND	36	LED-K
17	CLKIN-	37	LED-K
18	CLKIN+	38	NC
19	GND	39	LED-A
20	Rin3-	40	LED-A

Notes:

1. Display Size: 7.0” TFT
2. Optimal Viewing Direction: Full View (IPS)
3. Display Mode: Transmissive / Normally Black / Anti-Glare
4. Driver IC: HX8282-A11+HX8696-A00
5. Power Supply Voltage: 3.3V
6. Backlight: White LED / 19.2 V / 150 mA (Typ)
7. Brightness: 1100cd/m² (Typ)
8. 3M Brightness Enhancement Film

STANDARD TOLERANCE:
(UNLESS OTHERWISE SPECIFIED)

LINEAR: ±0.3mm

NEWHAVEN DISPLAY INTERNATIONAL

DRAWING/PART NUMBER: NHD-7.0-1024600AF-LSXP

REVISION: -

SIZE: A3

SCALE: 1:2

UNLESS OTHERWISE SPECIFIED:
- DIMENSIONS ARE IN MILLIMETERS
- THIRD ANGLE PROJECTION

DRAWN BY: P. Bartek
DRAWN DATE: 05/28/19
APPROVED BY: M. LaVine
APPROVED DATE: 05/28/19

DO NOT SCALE DRAWING
SHEET 1 OF 1

Pin Description

Pin No.	Symbol	Connection	Function Description
1	NC	-	No connection
2-3	V_{DD}	Power Supply	Supply voltage for LCD (+3.3V)
4	NC	-	No connection
5	/RES	MPU	Active LOW Reset signal (normally pull high)
6	/STBYB	MPU	Active LOW Standby signal (normally pull high)
7	GND	Power Supply	Power Ground
8	Rin0-	MPU	-LVDS differential data input CH0
9	Rin0+	MPU	+LVDS differential data input CH0
10	GND	Power Supply	Ground
11	Rin1-	MPU	-LVDS differential data input CH1
12	Rin1+	MPU	+LVDS differential data input CH1
13	GND	Power Supply	Ground
14	Rin2-	MPU	-LVDS differential data input CH2
15	Rin2+	MPU	+LVDS differential data input CH2
16	GND	Power Supply	Ground
17	CLKIN-	MPU	-LVDS differential Clock
18	CLKIN+	MPU	+LVDS differential Clock
19	GND	Power Supply	Ground
20	Rin3-	MPU	-LVDS differential data input CH3
21	Rin3+	MPU	+LVDS differential data input CH3
22	GND	Power Supply	Ground
23 - 24	NC	-	No connection
25	GND	Power Supply	Ground
26	NC	-	No Connection
27	BIST	MPU	Built in Self-Test BIST = H: Self-Test Enabled BIST = L: Normal Operation (Default)
28	INSEL	MPU	Data Input Format: INSEL = L 8-Bit LVDS Input (Default) INSEL = H 6-Bit LVDS Input
29	NC	-	No connection
30	GND	Power Supply	Power Ground
31-32	NC	-	No connection
33	SHLR	MPU	Gate Driver Left/Right Scan Setting: SHLR = H: Normal Scan (Default) SHLR = L: Reverse Scan
34	UPDN	MPU	Gate Driver Up/Down Scan Setting: UPDN = H: Reverse Scan UPDN = L: Normal Scan (Default)
35	NC	-	No Connection
36-37	LED-K	Power Supply	Backlight Cathode (Ground)
38	NC	-	No connection
39-40	LED-A	Power Supply	Backlight Anode (150mA @ 19.2V)

Recommended LCD connector: 40pin 0.5mm pitch FFC. Molex P/N: 54104-4031 (top contact)

Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	T_{OP}	Absolute Max	-20	-	+70	°C
Storage Temperature Range	T_{ST}	Absolute Max	-30	-	+80	°C
Supply Voltage for LCD	V_{DD}	-	3.0	3.3	3.6	V
Supply Current for LCD	I_{DD}	V_{DD} = 3.3V	45	90	135	mA
LVDS Differential input high Threshold voltage	R_XVTH	R_XVCM = 1.2V	-	-	+100	mV
LVDS Differential input low Threshold voltage	R_XVTL		-100	-	-	mV
LVDS Differential input common mode voltage	R_XVCM	-	|VID|/2	-	2.4-|VID|/2	V
LVDS Differential voltage	|VID|	-	200	-	600	mV
Backlight Supply Voltage	V_{LED}	-	18	19.2	20.4	V
Backlight Supply Current	I_{LED}	V_{LED} = 19.2	-	150	-	mA
Backlight Lifetime*	-	I_{LED} = 150 mA T_{OP} = 25° C	20,000	50,000	-	Hrs.

*Backlight Lifetime is rated as Hours until **half-brightness**, under normal operating conditions.

Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Optimal Viewing Angles	Top	φY+	Cr ≥ 10	-	85	-	o
	Bottom	φY-		-	85	-	o
	Left	θX-		-	85	-	o
	Right	θX+		-	85	-	o
Contrast Ratio		Cr	-	500	800	-	-
Luminance		L_V	-	800	1100	-	cd/m^2
Response Time		$T_R + T_F$	T_{OP} = 25°C	-	25	40	ms
Chromaticity	Red	X_R	-	0.563	0.603	0.643	-
		Y_R	-	0.308	0.348	0.388	-
	Green	X_G	-	0.273	0.313	0.353	-
		Y_G	-	0.541	0.581	0.621	-
	Blue	X_B	-	0.118	0.158	0.198	-
		Y_B	-	0.066	0.106	0.146	-
	White	X_W	-	0.263	0.303	0.343	-
		Y_W	-	0.270	0.310	0.350	-

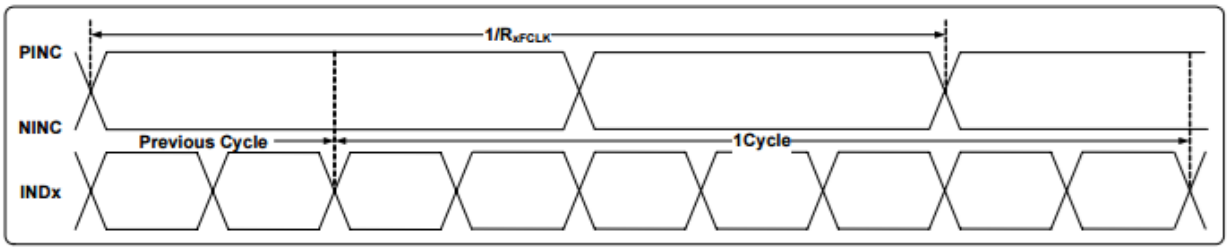
Driver Information

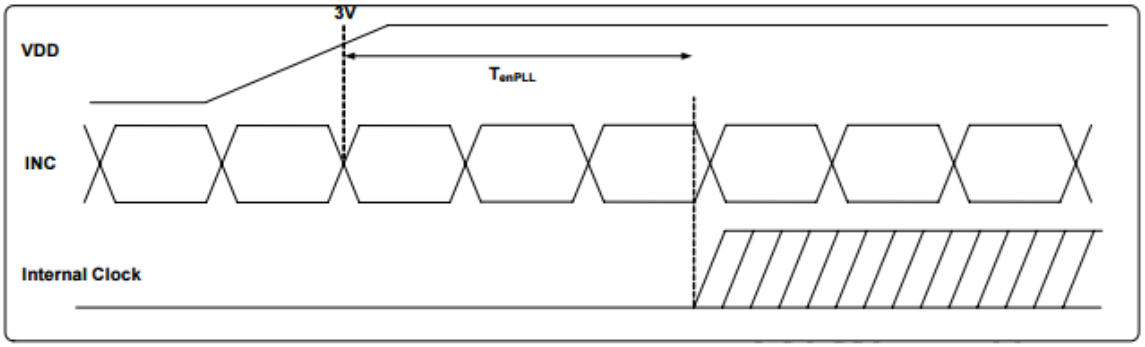
Built-in HX8282 Source Driver: http://www.newhavendisplay.com/appnotes/datasheets/LCDs/HX8282-A01.pdf
Built-in HX8696 Gate Driver: http://www.newhavendisplay.com/appnotes/datasheets/LCDs/HX8696-A.pdf

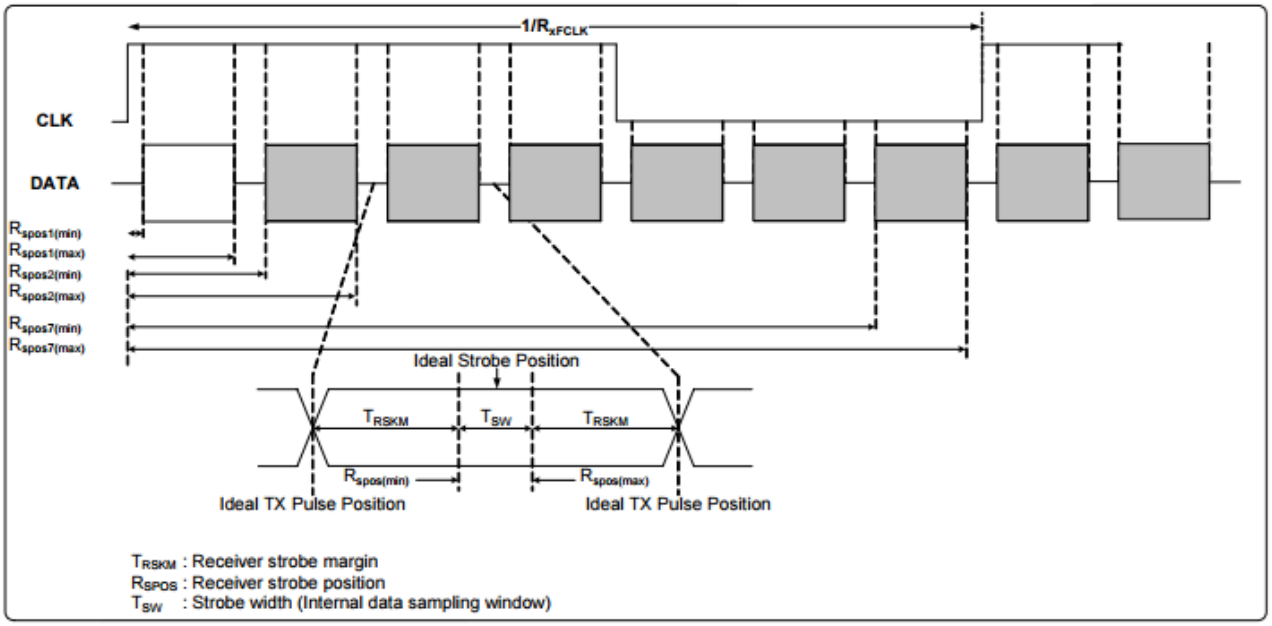
Timing Characteristics

Parameter	Symbol	Spec			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	R_{XFCLK}	20	-	71	MHz	-
Input data skew margin	T_{RSKM}	500	-	-	pS	| VID | = 400mV R_{XVCM} = 1.2V R_{XFCLK} = 71MHz
Clock high time	T_{LVCH}	-	4/(7 * R_{XFCLK})	-	nS	-
Clock low time	T_{LVCL}	-	3/(7 * R_{XFCLK})	-	nS	-
PLL wake-up time	T_{emPLL}	-	-	150	µS	-

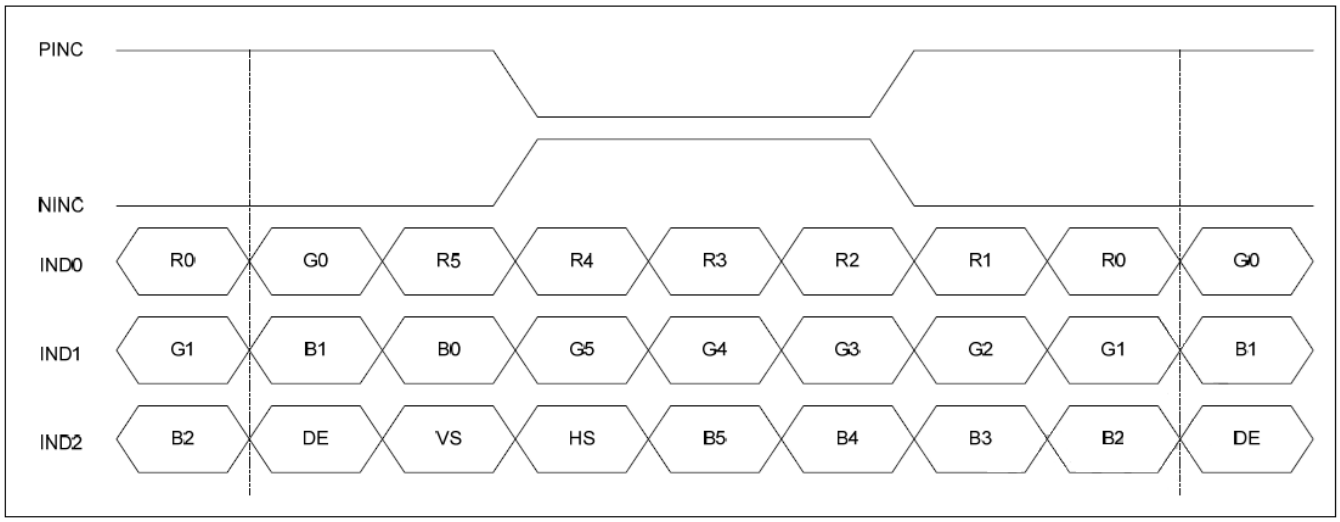
Parameter	Symbol	Spec			Unit	Condition
		Min.	Typ.	Max.		
Modulation Frequency	SSC_{MF}	23	-	93	KHz	-
Modulation Rate	SSC_{MR}	-	-	±3	%	LVDS Clock = 71 MHz



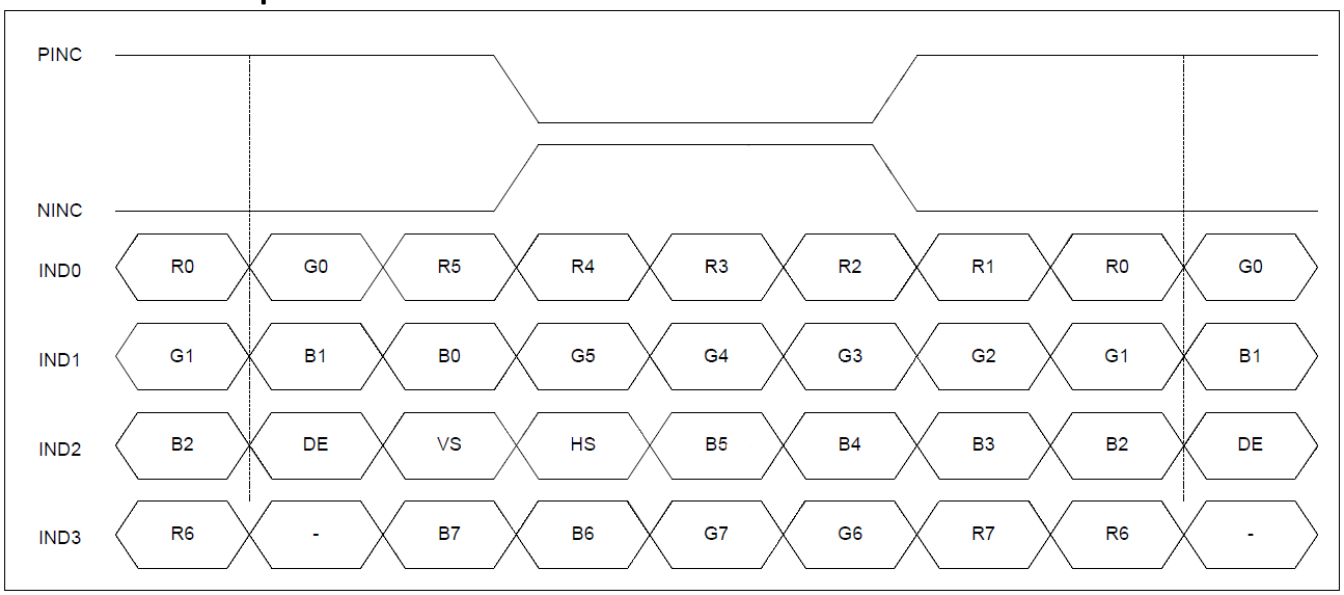




6-bit LVDS data input format:



8-Bit LVDS Data Input Format:



Quality Information

Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	+80°C, 240 hrs.	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C, 240 hrs.	1,2
High Temperature Operation	Endurance test applying the electric stress (voltage & current) and the high thermal stress for a long time.	+70°C, 120 hrs.	2
Low Temperature Operation	Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time.	-20°C, 120 hrs.	1,2
High Temperature / Humidity Operation	Endurance test applying the electric stress (voltage & current) and the high thermal with high humidity stress for a long time.	+50°C, 90% RH, 120 hrs.	1,2
Thermal Shock resistance	Endurance test applying the electric stress (voltage & current) during a cycle of low and high thermal stress.	-30°C, 30min->25°C, 10min -> 80°C, 30min 10 cycles	
Vibration test	Endurance test applying vibration to simulate transportation and use.	Frequency : 250 r/min Amplitude : 1 inch Time: 45min	3
Static electricity test	Endurance test applying electric static discharge.	Air: V_S=8KV, Contact: V_S=4KV 10 Times	

Note 1: No condensation to be observed.
Note 2: Conducted after 4 hours of storage at 25°C, 0%RH.
Note 3: Test performed on product itself, not inside a container.

Precautions for using LCDs/LCMs

See Precautions at www.newhavendisplay.com/specs/precautions.pdf

Warranty Information and Terms & Conditions

http://www.newhavendisplay.com/index.php?main_page=terms