

Product Specification

NHD-10.1-1024600BF-ASXP

TFT Liquid Crystal Display

NHD-	Newhaven Display
10.1-	10.1" Diagonal
1024600-	1024xRGBx600 Pixels
BF-	Model
A-	RGB Interface
S-	High Brightness, White LED Backlight
X-	TFT
P-	IPS, Wide Temperature

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Additional Resources

- **Support Forum:** <https://support.newhavendisplay.com/hc/en-us/community/topics>
- **GitHub:** <https://github.com/newhavendisplay>
- **Example Code:** <https://support.newhavendisplay.com/hc/en-us/categories/4409527834135-Example-Code/>
- **Knowledge Center:** https://www.newhavendisplay.com/knowledge_center.html
- **Quality Center:** https://www.newhavendisplay.com/quality_center.html
- **Precautions for using LCDs/LCMs:** <https://www.newhavendisplay.com/specs/precautions.pdf>
- **Warranty / Terms & Conditions:** <https://www.newhavendisplay.com/terms.html>

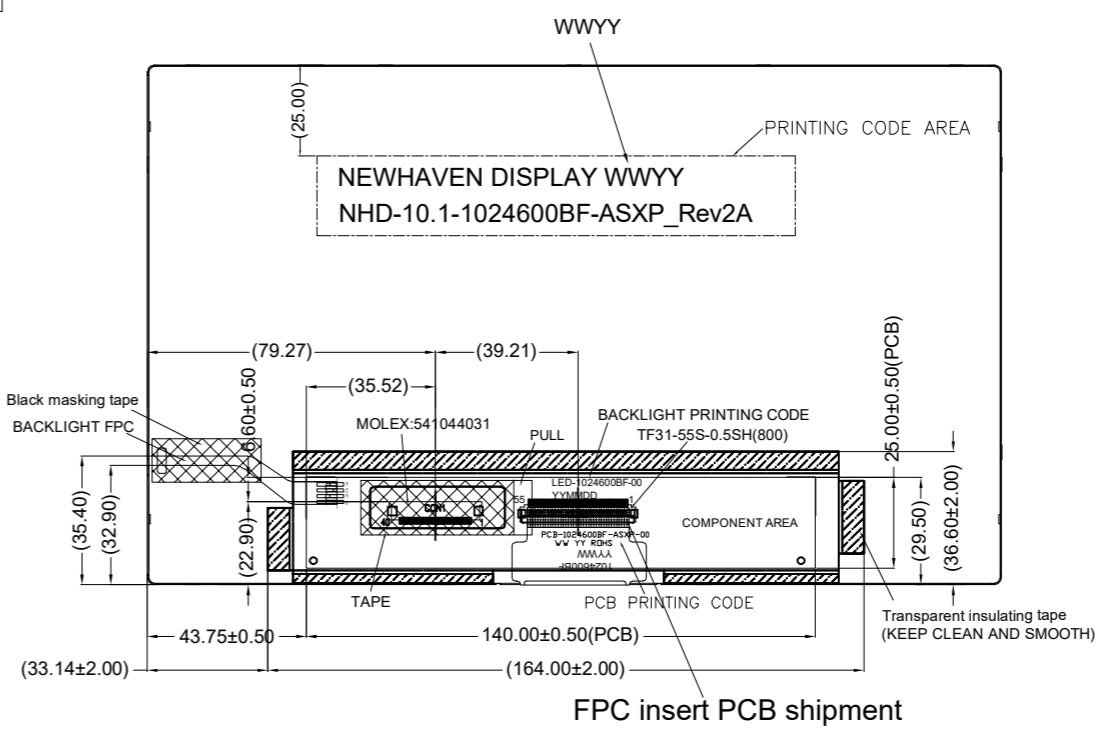
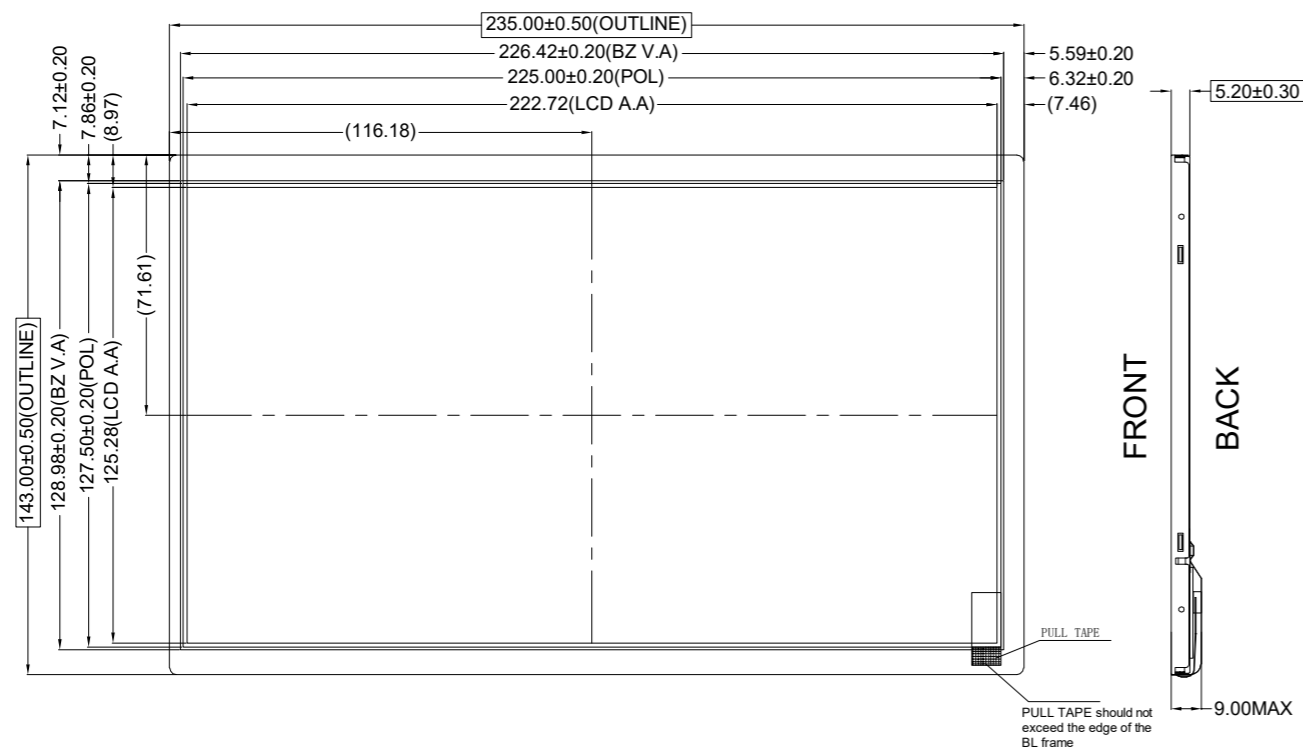


Document Revision History

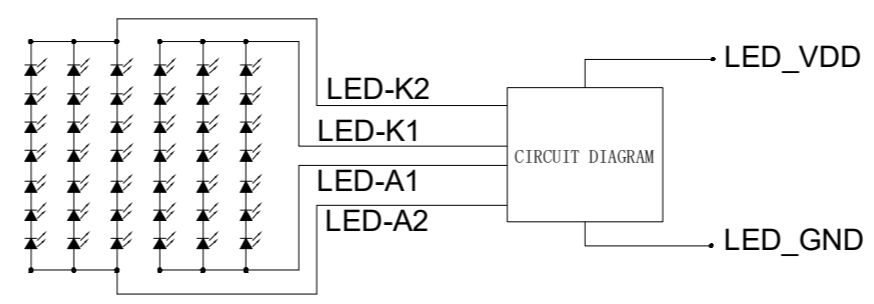
Revision	Date	Description	Changed By
0	03/01/2022	Initial Release	ZP
1	04/18/2022	Included Backlight Driver IC	ZP
2	08/04/2022	Updated the LCD Supply Current, Backlight Enable Voltage and Chromaticity values.	JT
3	08/17/2022	Updated the Operating and Storage temperature range and Quality Information	JT
4	09/07/2022	Added Backlight PWM Frequency Range	JT
5	10/12/2022	Updated Mechanical Drawing Page	JT

Mechanical Drawing

SYMBOL	REVISION	DATE



PIN	Symbol	PIN	Symb
1	LED-GND	21	G4
2	LED_VDD	22	G5
3	LED_VDD	23	G6
4	LED_VDD	24	G7
5	LED_PWM	25	B0
6	LED_EN	26	B1
7	GND	27	B2
8	VDD	28	B3
9	R0	29	B4
10	R1	30	B5
11	R2	31	B6
12	R3	32	B7
13	R4	33	GND
14	R5	34	DCLK
15	R6	35	HSD
16	R7	36	VSD
17	G0	37	DEN
18	G1	38	MOD
19	G2	39	RESE
20	G3	40	STBY



- Product Description: 10.1" IPS TFT**
- TFT Driver IC: HX8282-A11; Backlight Driver IC: MP3398EGF
 - TFT Interface: 24-bit RGB
 - TFT Power Requirement: 3.3V, Backlight: 360mA/12.0V
 - Optical Features: Full View, Transmissive, Normally Black, 800 cd/m²

Standard Tolerance: (Unless otherwise specified) Linear: ±0.3mm		
	Drawing/Part Number: NHD-10.1-1024600BF-ASXP	Revision: 2A
Unless otherwise specified: • Dimensions are in Millimeters • Third Angle Projection	Drawn By: J.Thomas	Approved By: J.Thomas
	Drawn Date: 10/12/2022	Approved Date: 10/12/2022
Do Not Scale Drawing		Sheet 1 of 1
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Pin Description

TFT:

Pin No.	Symbol	Connection	Function Description
1	LED_GND	Power Supply	Ground for Backlight Driver
2-4	LED_VDD	Power Supply	Supply Voltage for Backlight Driver
5	LED_PWM	MPU	Backlight PWM Signal Input (See Table Below)
6	LED_EN	MPU	Backlight Enable H: Backlight On; L: Backlight Off
7	GND	Power Supply	Ground
8	V _{DD}	Power Supply	Supply voltage for LCD (+3.3V)
9-16	[R0-R7]	MPU	Red Data Signals
17-24	[G0-G7]	MPU	Green Data Signals
25-32	[B0-B7]	MPU	Blue Data Signals
33	GND	Power Supply	Ground
34	DCLK	MPU	Dot data Clock
35	HSYNC	MPU	Horizontal sync input
36	VS _{YNC}	MPU	Vertical sync input
37	DEN	MPU	Data Enable signal
38	MODE	MPU	DE/SYNC mode select MODE= H: DE mode MODE= L: SYNC mode
39	RESET	MPU	Active Low Reset Signal
40	STBYB	MPU	Active Low Standby Signal

Recommended LCD connector: 0.5mm pitch 40-Conductor FFC.

Recommended Cable: 40 POS FFC

Molex P/N: 15020-0435

Driver/Controller Information

TFT:

Source Driver: HX8282-A11 <https://support.newhavendisplay.com/hc/en-us/articles/4414530594583-HX8282-A11>

Gate Driver: HX8696-A01 <https://support.newhavendisplay.com/hc/en-us/articles/4414548297367-HX8696-A>

Backlight Driver: MP3398EGF



Electrical Characteristics

TFT:

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}	$V_{DD} = 3.3V$	96.5	193	240	mA
"H" Level input	V_{IH}	-	$0.7 * V_{DD}$	-	V_{DD}	V
"L" Level input	V_{IL}	-	GND	-	$0.3 * V_{DD}$	V
"H" Level output	V_{OH}	-	$V_{DD} - 0.4$	-	V_{DD}	V
"L" Level output	V_{OL}	-	-	-	$GND + 0.4$	V
Supply Voltage for Backlight Driver	LED_V_{LED}	-	5.0	12.0	22.4	V
Supply Current for Backlight Driver ¹	LED_I_{LED}	-	160	360	1200	mA
Backlight Lifetime ²	-	$T_{OP} = 25^{\circ}C$	30,000	-	-	Hrs.
Backlight Enable Voltage	LED_EN	-	1.5	3.3	5.5	V
Backlight PWM Voltage	LED_PWM	-	1.5	3.3	5.5	V
Backlight PWM Frequency	-	$LED_PWM = 3.3V$	200	-	2000	Hz

¹Minimum supply current occurs when supply voltage is at max; maximum supply current when supply voltage is at minimum.

²Backlight 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	$\phi Y+$	CR ≥ 10	-	80	-	°
	Bottom	$\phi Y-$		-	80	-	°
	Left	$\theta X-$		-	80	-	°
	Right	$\theta X+$		-	80	-	°
Contrast Ratio	CR	-	600	800	-	-	
Luminance	L_V	-	600	800	1000	cd/m ²	
Response Time (Rise + Fall)	$T_R + T_F$	$T_{OP} = 25^{\circ}C$	-	25	35	ms	
Chromaticity	Red	X_R	-	0.57	0.60	0.63	-
		Y_R	-	0.33	0.36	0.39	-
	Green	X_G	-	0.30	0.33	0.36	-
		Y_G	-	0.51	0.54	0.57	-
	Blue	X_B	-	0.10	0.13	0.16	-
		Y_B	-	0.05	0.08	0.11	-
White	X_W	-	0.28	0.31	0.34	-	
	Y_W	-	0.30	0.33	0.36	-	

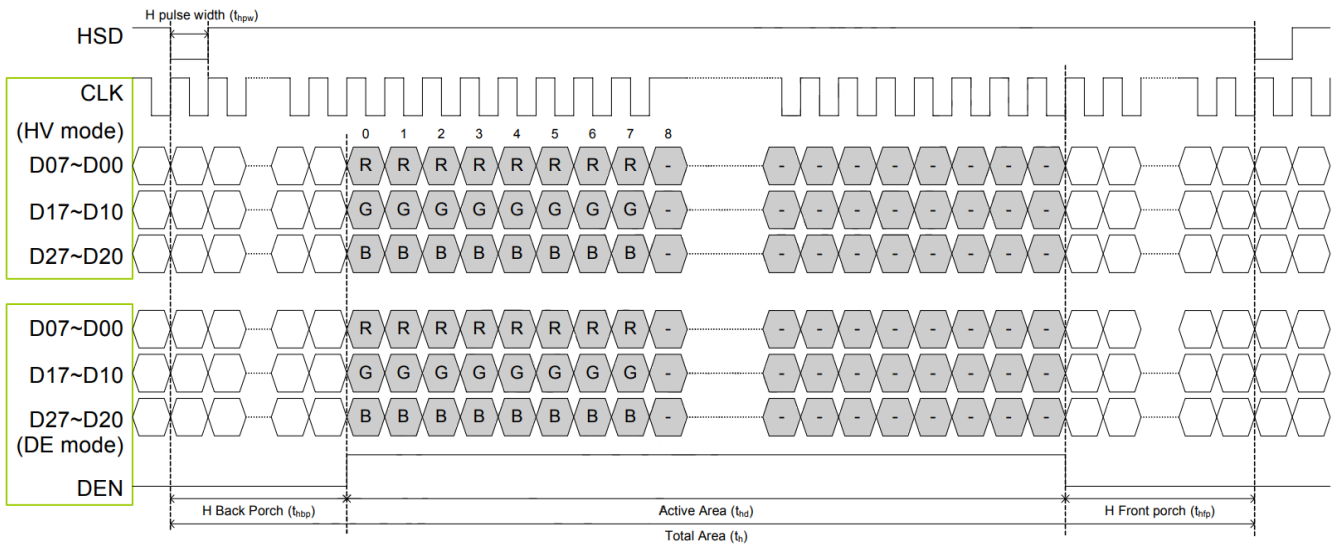
Timing Characteristics – TFT Display

DE Mode

Parameter	Symbol	Spec			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	40.8	51.2	67.2	MHz
Horizontal Display Area	thd	1024			DCLK
HSD Period	th	1114	1344	1400	DCLK
HSD Blanking	thb+ thfp	90	320	376	DCLK
Vertical Display Area	tvd	600			TH
VSD Period	tv	610	635	800	TH
VSD Blanking	tvbp+ tvfp	10	35	200	TH

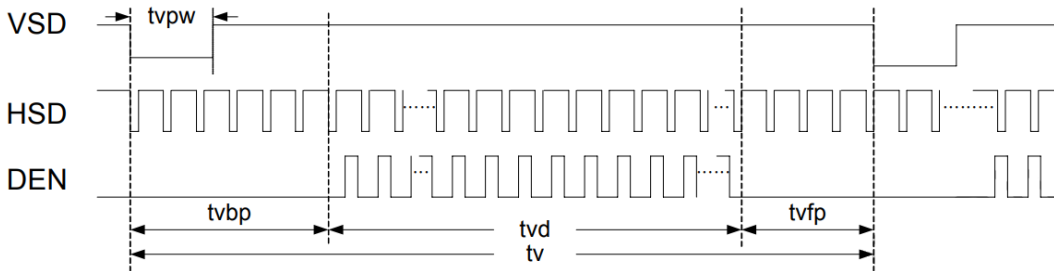
Horizontal Timing

Parameter	Symbol	Spec			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	44.9	51.2	63	MHz
Horizontal Display Area	thd	1024			DCLK
HSD Period	th	1200	1344	1400	DCLK
HSD Pulse Width	thpw	1	-	140	DCLK
HSD Back Porch	thbp	160			DCLK
HSD Front Porch	thfp	16	160	216	DCLK



Vertical Timing

Parameter	Symbol	Spec			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd	600			TH
VSD Period	tv	624	635	750	TH
VSD Pulse Width	tvpw	1	-	20	TH
VSD Back Porch	tvbp	23			TH
VSD Front Porch	tvfp	1	12	127	TH



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 Storage	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:250r/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.