

Product Specification

NHD-10.1-1024600BF-LSXP

TFT Liquid Crystal Display

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

Table of Contents

Document Revision History.....	2
Mechanical Drawing	3
Pin Description	4
Driver Information.....	5
Electrical Characteristics	5
Optical Characteristics	5
Timing Characteristics – TFT Display.....	6
Quality Information.....	8

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>

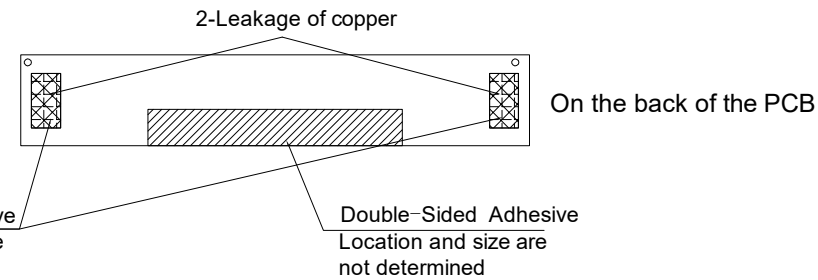
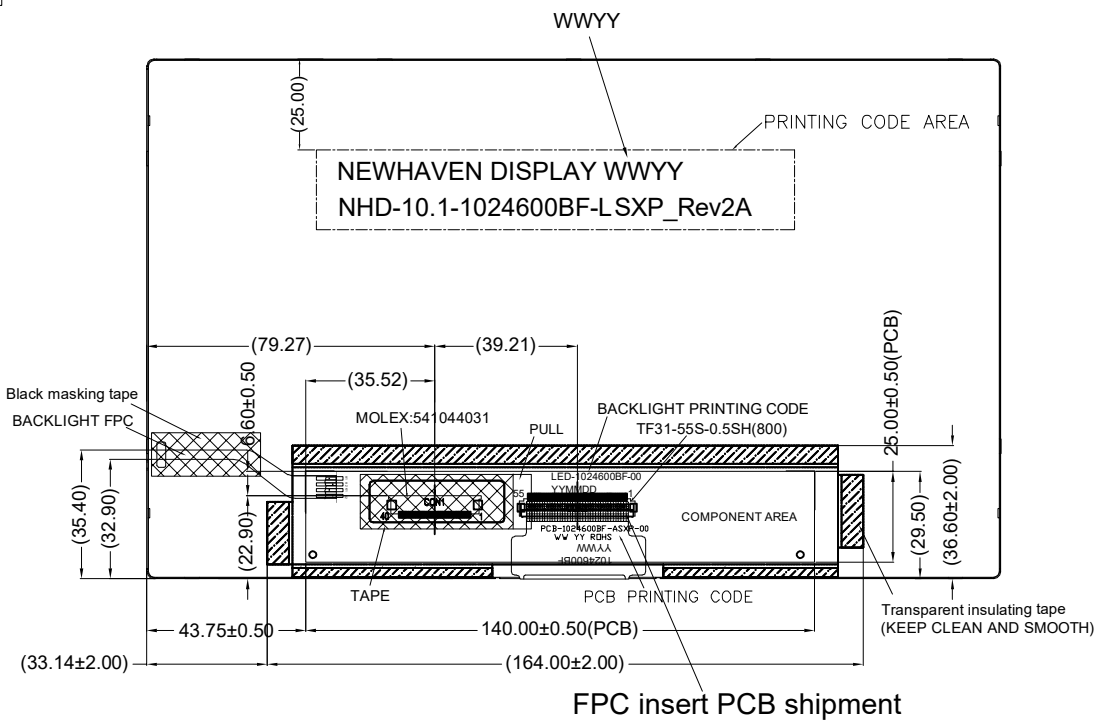
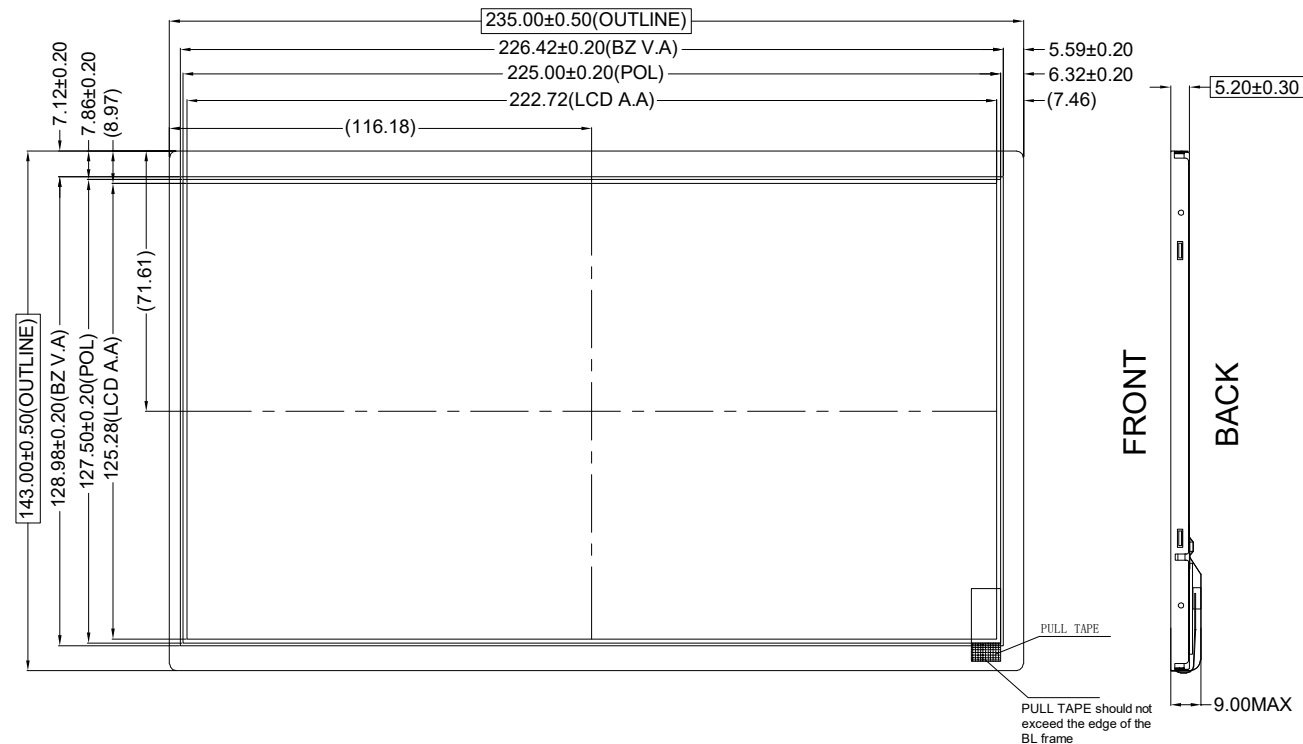


Document Revision History

Revision	Date	Description	Changed By
0	03/01/2022	Initial Release	ZP
1	04/13/2022	Included Backlight Driver IC	JT
2	08/04/2022	Updated LCD Supply Current, Backlight Enable Voltage and Chromaticity values.	JT
3	08/16/2022	Updated Operating and Storage Temperature Range, and Differential Input Common Voltage	JT
4	09/08/2022	Updated the Backlight PWM Frequency Range	JT

Mechanical Drawing

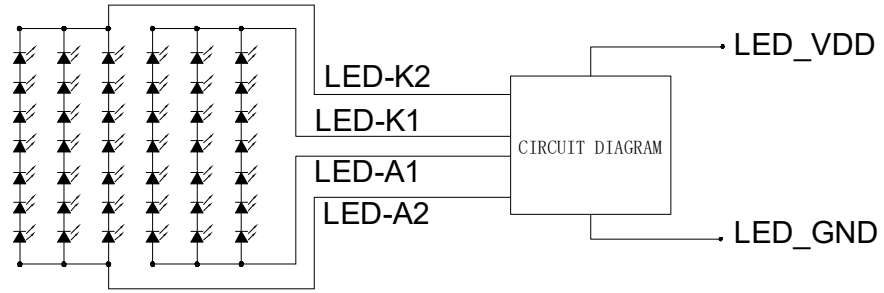
SYMBOL	REVISION	DATE



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

Product Description: 10.1" IPS TFT

1. TFT Driver IC: HX8282-A11; Backlight Driver IC: MP3398EGF
2. TFT Interface: LVDS
3. TFT Power Requirement: 3.3V, Backlight: 12.0V
4. Optical Features: Full View, Transmissive, 800 cd/m²



Standard Tolerance:
(Unless otherwise specified)

Linear: ±0.3mm

Unless otherwise specified:

- Dimensions are in Millimeters
- Third Angle Projection

NEWHAVEN DISPLAY INTERNATIONAL

Drawing/Part Number:
NHD-10.1-1024600BF-LSXP

Revision:
2A

Size:
A3

Scale:
NS

Do Not Scale Drawing

Sheet 1 of 1

This drawing is solely the property of Newhaven Display International, Inc. The information it contains is not to be disclosed, reproduced or copied in whole or part without written approval from Newhaven Display.

Pin Description

TFT:

Pin No.	Symbol	Connection	Function Description
1	GND	Power Supply	Ground
2-3	V _{DD}	Power Supply	Supply voltage for LCD (+3.3V)
4	V _{EDID}	Power Supply	Supply voltage for EDID (+3.3V)
5	GND	Power Supply	Ground
6	SCL	MPU	Serial Clock for EDID
7	SDA	MPU	Serial Data for EDID
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	INSEL (HSD)	MPU	Data Input Format: INSEL = L 8-Bit LVDS Input (Default) INSEL = H 6-Bit LVDS Input
24-25	GND	Power Supply	Ground
26	UPDN	MPU	Gate Driver Up/Down Scan Setting: UPDN = H: Reverse Scan UPDN = L: Normal Scan (Default)
27	SHLR	MPU	Gate Driver Left/Right Scan Setting: SHLR = H: Normal Scan (Default) SHLR = L: Reverse Scan
28	GND	Power Supply	Ground
29	RESET	MPU	Active Low Reset Signal
30	STBYB	MPU	Active Low Standby Signal
31-33	LED_GND	Power Supply	Ground for Backlight Driver
34	GND	Power Supply	Ground
35	LED_PWM	MPU	Backlight PWM Signal Input (See Table Below)
36	LED_EN	MPU	Backlight Enable H: Backlight On; L: Backlight Off
37	BIST	MPU	Built in Self-Test BIST = H: Self-Test Enabled BIST = L: Normal Operation (Default)
38-40	LED_V _{DD}	Power Supply	Supply Voltage for Backlight Driver

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

Recommended Cable: 40 POS FFC

Molex P/N: 15020-0435



Driver 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 IC: 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 Voltage for EDID	V _{EDID}	-	3.0	3.3	3.6	V
Supply Current for LCD	I _{DD}	V _{DD} = 3.3V	84.5	169	210	mA
LVDS Differential input HIGH Voltage	RxVTH	-	-	-	+100	mV
LVDS Differential input LOW Voltage	RxVTL	-	-100	-	-	mV
LVDS Differential input Common Voltage	RxVCM	-	VID /2	-	VDD-1.2	V
LVDS Differential Voltage	VID	-	200	-	600	mV
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°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.

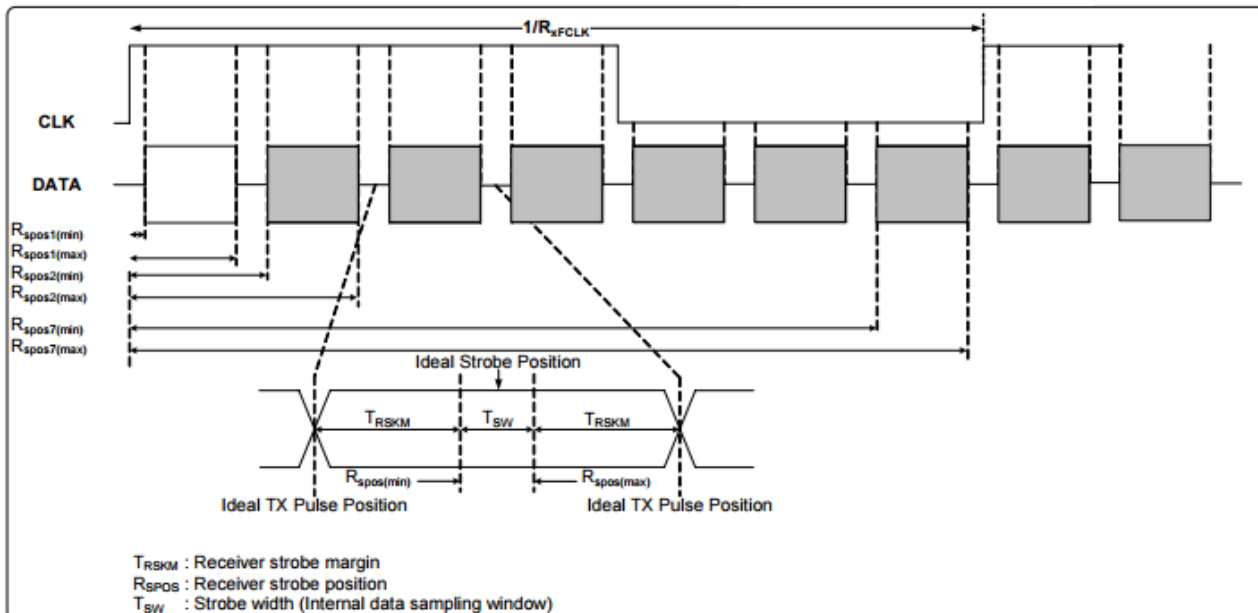
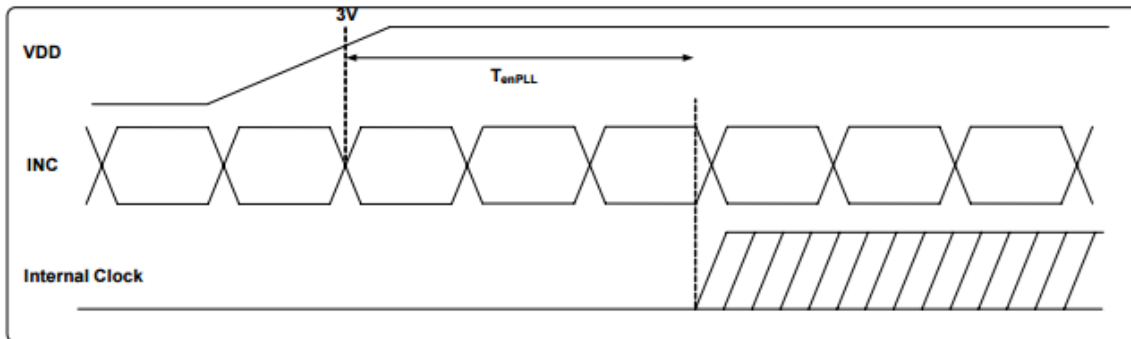
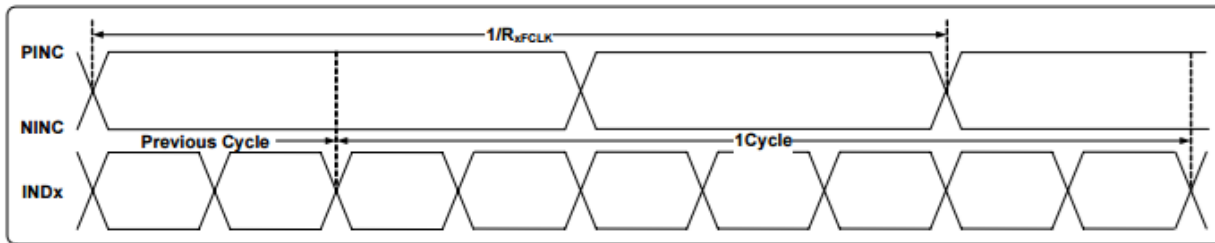
Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Optimal Viewing Angles	Top	φY+	CR ≥ 10	-	80	-	°
	Bottom	φY-		-	80	-	°
	Left	θX-		-	80	-	°
	Right	θX+		-	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°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	-

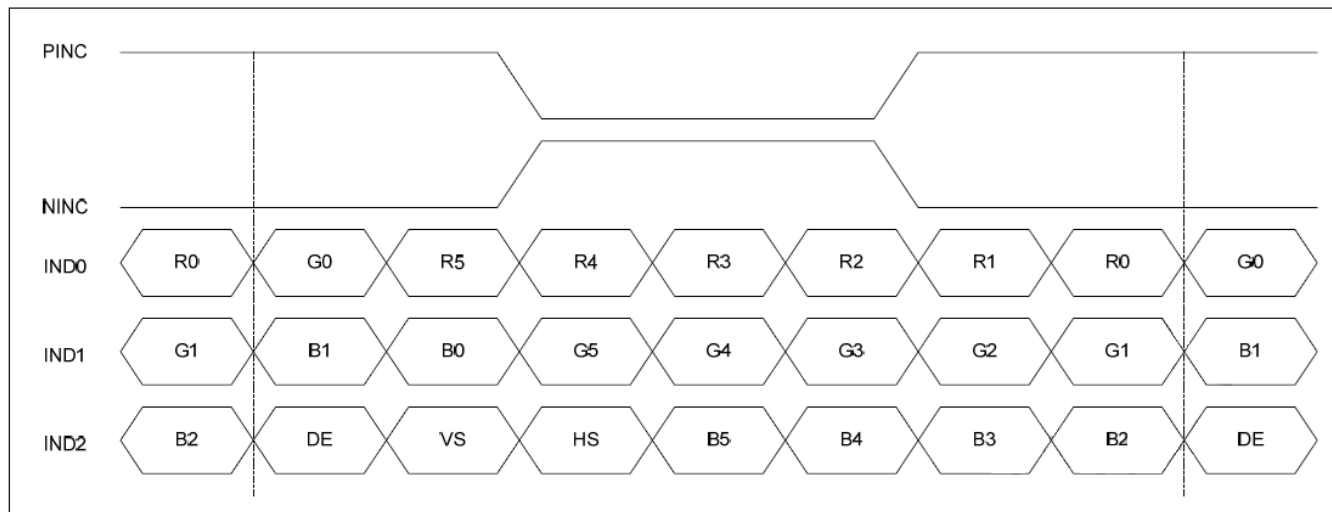
Timing Characteristics – TFT Display

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

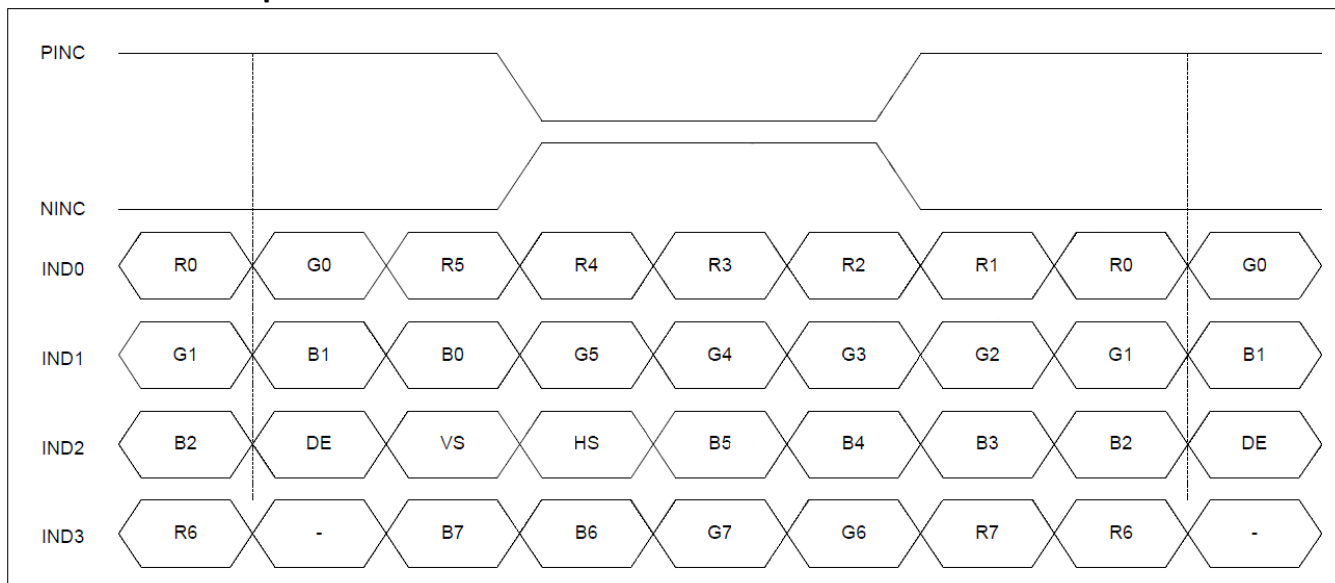
Parameter	Symbol	Spec			Unit	Condition
		Min.	Typ.	Max.		
Modulation Frequency	SSC _{MF}	23	-	93	KHz	-
Modulation Rate	SSC _{MR}	-	-	±3	%	LVDS Clock = 71 MHz



6-bit LVDS data input format:



8-Bit LVDS Data Input Format:



Horizontal & Vertical Timing (1024x600)

Item		Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DCLK Frequency		F _{CLK}	44.9	51.2	63	MHz
HSYNC	Horizontal Display Area	T _{HD}	1024			DCLK
	HSD Period	T _H	1200	1344	1400	DCLK
	HSD Pulse Width	T _{HPW}	1	-	140	DCLK
	HSD Back Porch	T _{HBP}	160			DCLK
	HSD Front Porch	T _{HFP}	16	160	216	DCLK
VSYNC	Vertical Display Area	T _{VD}	600			T _H
	VSD Period	T _V	624	635	750	T _H
	VSD Pulse Width	T _{VPW}	1	-	20	T _H
	VSD Back Porch	T _{VBP}	23			T _H
	VSD Front Porch	T _{VFP}	1	12	127	T _H

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: 45 min	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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Newhaven Display:

[NHD-10.1-1024600BF-LSXP](#)