

NHD-4.3-800480CF-ASXP

TFT (Thin-Film-Transistor) Color Liquid Crystal Display Module

NHD-	Newhaven Display
4.3-	4.3" Diagonal
800480-	800xRGBx480 Pixels
CF-	Model
A-	Built-in Driver / No Controller
S-	High Brightness, White LED Backlight
X-	TFT
P-	IPS, Wide Temperature

Newhaven Display International, Inc.

2661 Galvin Ct.

Elgin IL, 60124

Ph: 847-844-8795

Fax: 847-844-8796

www.newhavendisplay.com

nhtech@newhavendisplay.com

nhsales@newhavendisplay.com

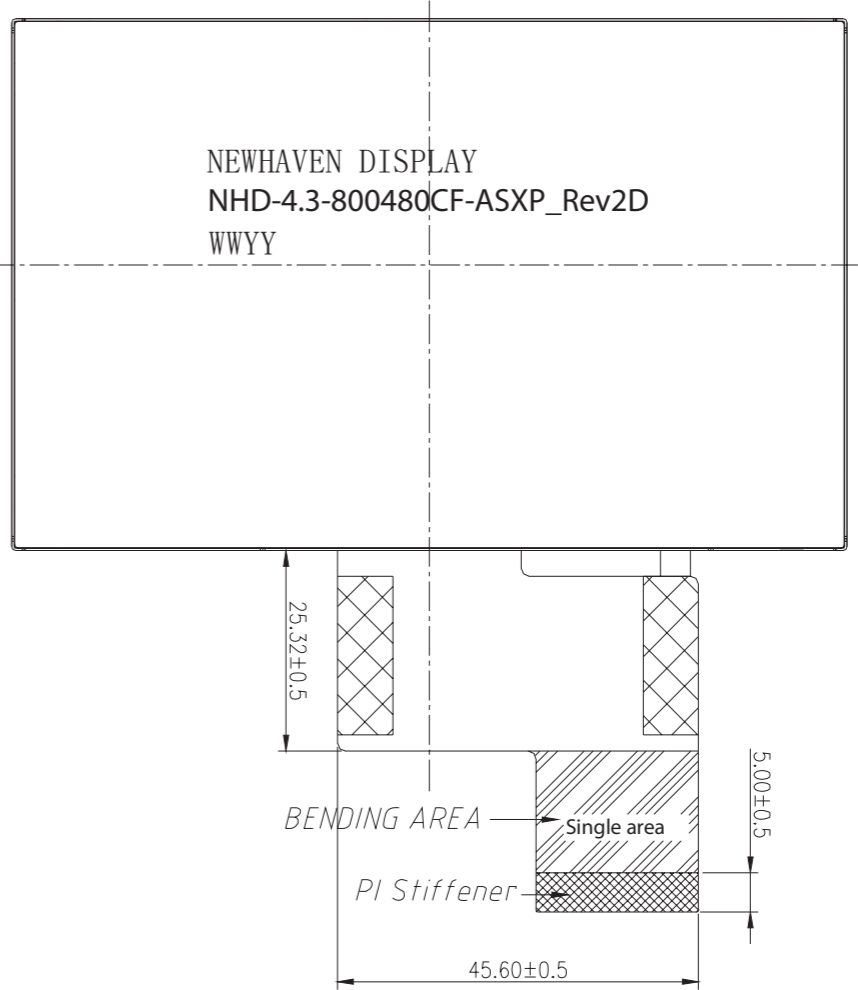
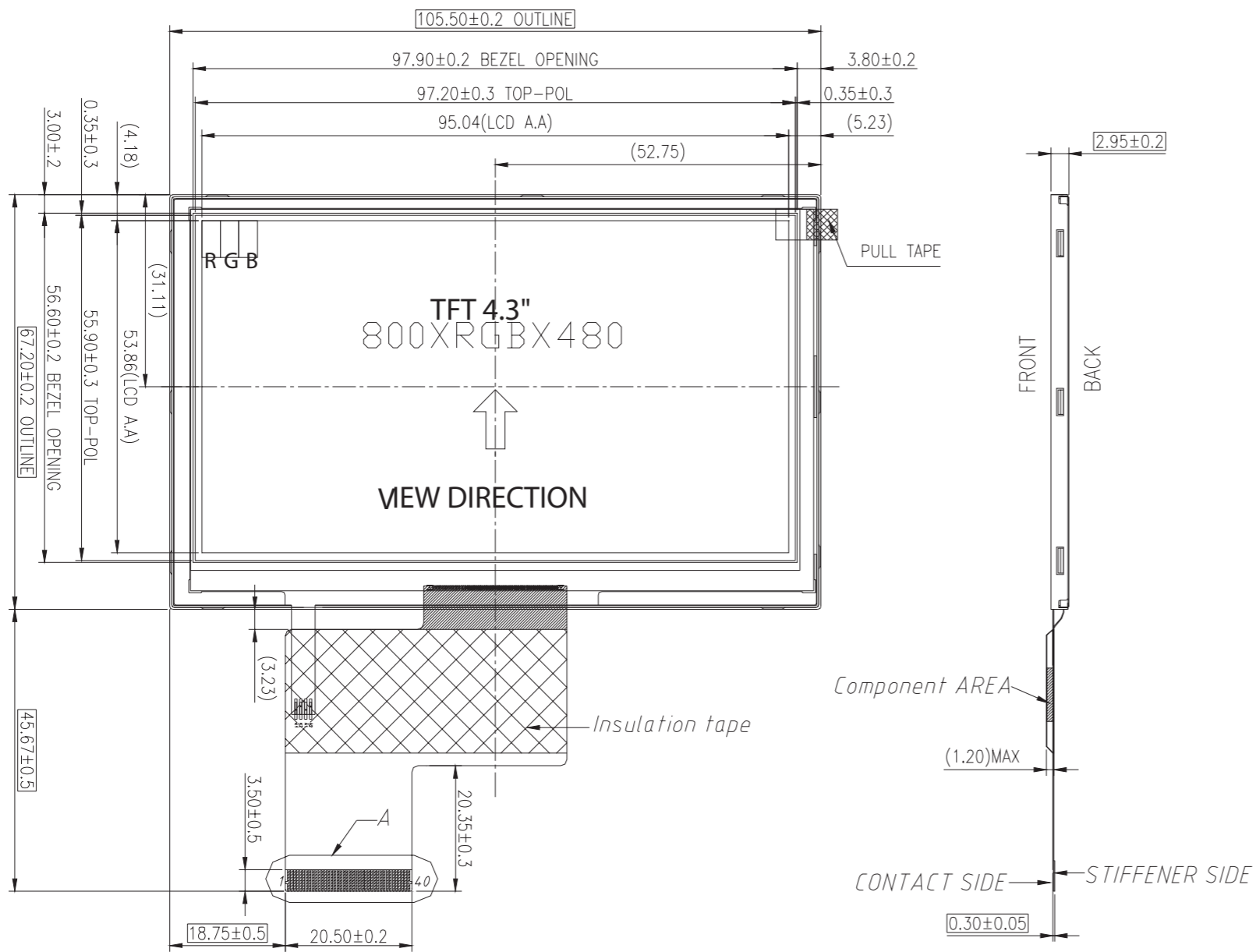
Document Revision History

Revision	Date	Description	Changed by
-	10/20/19	Initial Release	PK
1	5/12/20	Update to 2D Mechanical Drawing, Static Electricity Test Conditions	AS

Functions and Features

- 800xRGBx480 resolution, up to 16.7M colors
- High-brightness LED backlight
- IPS Type, Full Viewing Angles
- 24-Bit RGB interface

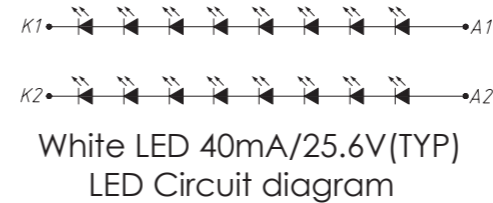
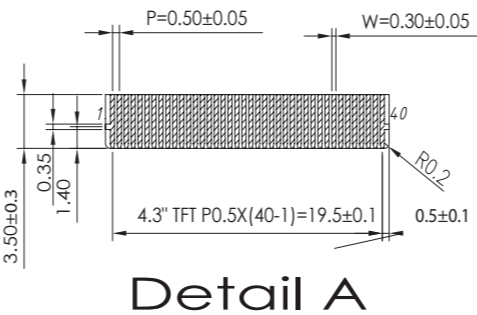
SYMBOL	REVISION	DATE



Pin Assignment

Pin No.	Symbol
1	LED-
2	LED+
3	GND
4	V _{DD}
5-12	[R0-R7]
13-20	[G0-G7]
21-28	[B0-B7]
29	GND
30	CLK
31	DISP
32	HSYNC
33	VSYNC
34	DEN
35	BIST
36	GND
37	NC
38	NC
39	NC
40	NC

- Notes:
1. Display Size: 4.3" TFT
 2. Optimal View: Full View IPS
 3. Display Mode: Transmissive / Normally Black / Anti-Glare
 4. Driver IC: EK9716BE3+EK73002AB2
 5. Supply Voltage: 3.3V
 6. Backlight: White LED / 25.6V / 40mA (Typ)
 7. Luminance: 850 cd/m² (Typ)
 8. 3M Brightness Enhancement Film



STANDARD TOLERANCE: (UNLESS OTHERWISE SPECIFIED)
LINEAR: ±0.3mm

NEWHAVEN DISPLAY INTERNATIONAL

DRAWING/PART NUMBER: **NHD-4.3-800480CF-ASXP** REVISION: 2D
 SIZE: A3

UNLESS OTHERWISE SPECIFIED: DRAWN BY: A. Shah APPROVED BY: A. Shah SCALE: NS
 DIMENSIONS ARE IN MILLIMETERS DRAWN DATE: 05/12/20 APPROVED DATE: 05/12/20
 THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING SHEET 1 OF 1

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Pin Description

Pin No.	Symbol	External Connection	Function Description
1	LED-	Power Supply	Backlight Cathode (Ground)
2	LED+	Power Supply	Backlight Anode (25.6V @ 40 mA)
3	GND	Power Supply	Ground
4	VDD	Power Supply	Supply Voltage for LCD and logic (3.3V)
5-12	[R0-R7]	MPU	Red Data signals
13-20	[G0-G7]	MPU	Green Data signals
21-28	[B0-B7]	MPU	Blue Data signals
29	GND	Power Supply	Ground
30	CLK	MPU	Pixel Clock signal
31	DISP	MPU	Display ON/OFF Signal
32	HSYNC	MPU	Line synchronization signal
33	VSYNC	MPU	Frame synchronization signal
34	DEN	MPU	Data Enable signal
35	BIST	MPU	Built in Self-Test. BIST = H: Self-Test Enabled. BIST = L: Normal Operation (Default)
36	GND	Power Supply	Ground
37	NC	-	No Connect
38	NC	-	No Connect
39	NC	-	No Connect
40	NC	-	No Connect

Recommended LCD connector: 0.5mm pitch 40-Conductor 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	V _{DD}	-	2.4	3.3	3.5	V
Supply Current	I _{DD}	V _{DD} = 3.3V	80	160	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
Backlight Supply Current	I _{LED}	-	30	40	50	mA
Backlight Supply Voltage	V _{LED}	I _{LED} = 40mA T _{OP} = 25°C	22.4	25.6	27.2	V
Backlight Lifetime*	-		30,000	50,000	-	Hrs.

*Backlight is current driven; do not supply more than 50mA. 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	-	80	-	°	
	Bottom	φY-		-	80	-	°	
	Left	θX-		-	80	-	°	
	Right	θX+		-	80	-	°	
Contrast Ratio	CR	-	640	800	-	-		
Luminance	L _V	I _{LED} = 40 mA	680	850	-	cd/m ²		
Response Time	Rise + Fall	T _R +T _F	T _{OP} = 25°C		-	30	40	ms
Chromaticity	Red	X _R	-	0.558	0.598	0.638	-	
		Y _R	-	0.305	0.345	0.385	-	
	Green	X _G	-	0.335	0.375	0.415	-	
		Y _G	-	0.521	0.561	0.601	-	
	Blue	X _B	-	0.103	0.143	0.183	-	
		Y _B	-	0.062	0.102	0.142	-	
White	X _W	-	0.269	0.309	0.349	-		
	Y _W	-	0.279	0.319	0.355	-		

* Luminance is directly related to Backlight Supply Current.

Driver Information

Built-in EK9716B Source Driver: https://www.newhavendisplay.com/appnotes/datasheets/LCDs/EK9716B_v1-1.pdf

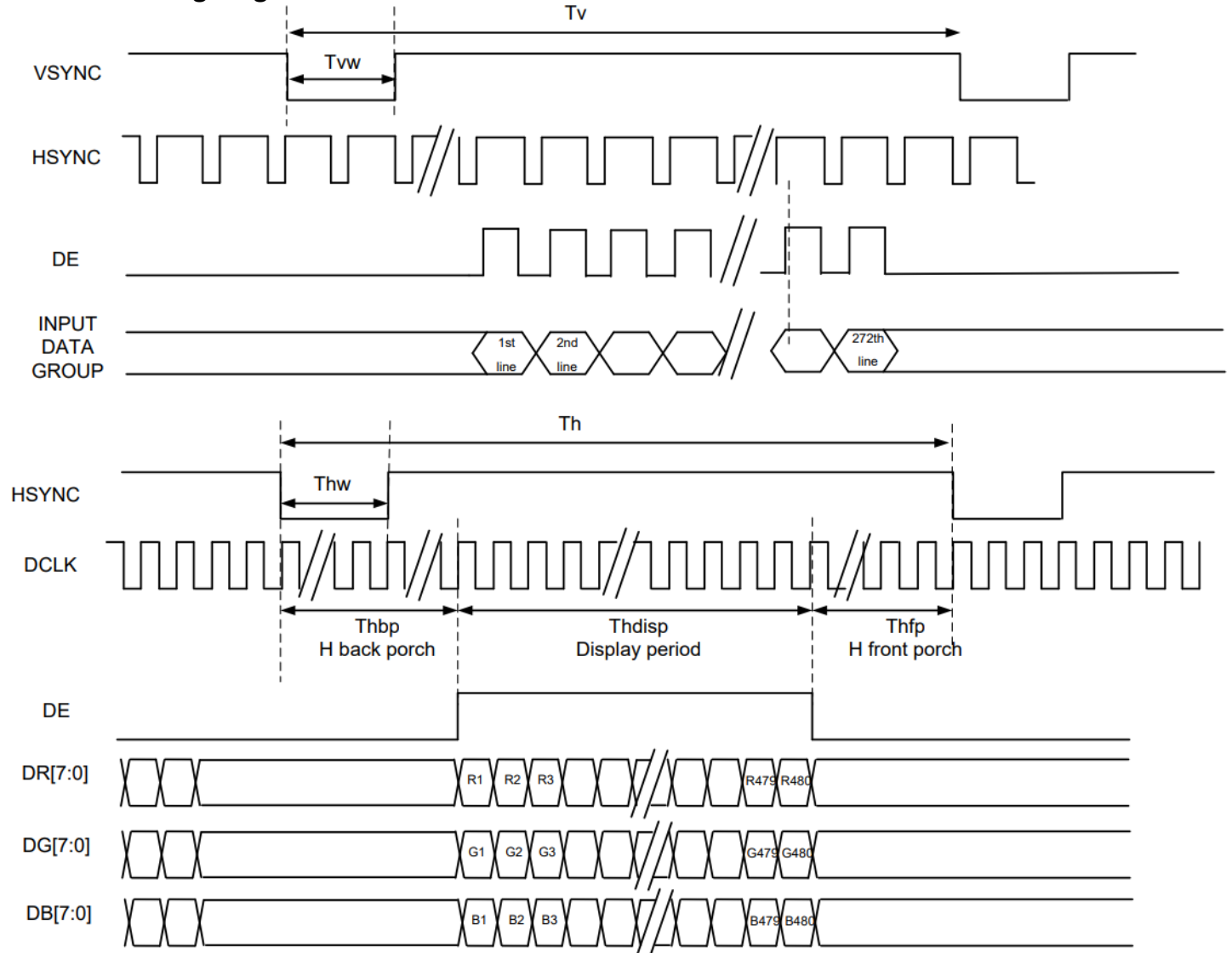
Built-in EK73002AB2 Gate Driver: <https://www.newhavendisplay.com/appnotes/datasheets/LCDs/EK73002AB2.pdf>

Timing Characteristics

Parallel RGB Input Timing Requirements

Item	Symbol	Min.	Typ.	Max.	Unit	Remark	
DCLK Frequency	Fclk	28.2	29.2	40	MHz	-	
DLCK Period	Tclk	25	34	-	ns	-	
HSYNC	Period Time	Th	908	928	1088	DCLK	Thw + Thbp = 88 DLCK is fixed
	Display Period	Thdisp	800			DCLK	
	Pulse Width	Thw	1	48	87	DCLK	
	Back Porch	Thbp	87	40	1	DCLK	
	Front Porch	Thfp	20	40	200	DCLK	-
VSYNC	Period Time	Tv	517	525	613	H	Tvw + Tvbp = 32 H is fixed
	Display Period	Tvdisp	480			H	
	Pulse Width	Tvw	1	1	3	H	
	Back Porch	Tvbp	31	31	29	H	
	Front Porch	Tvfp	5	13	101	H	-

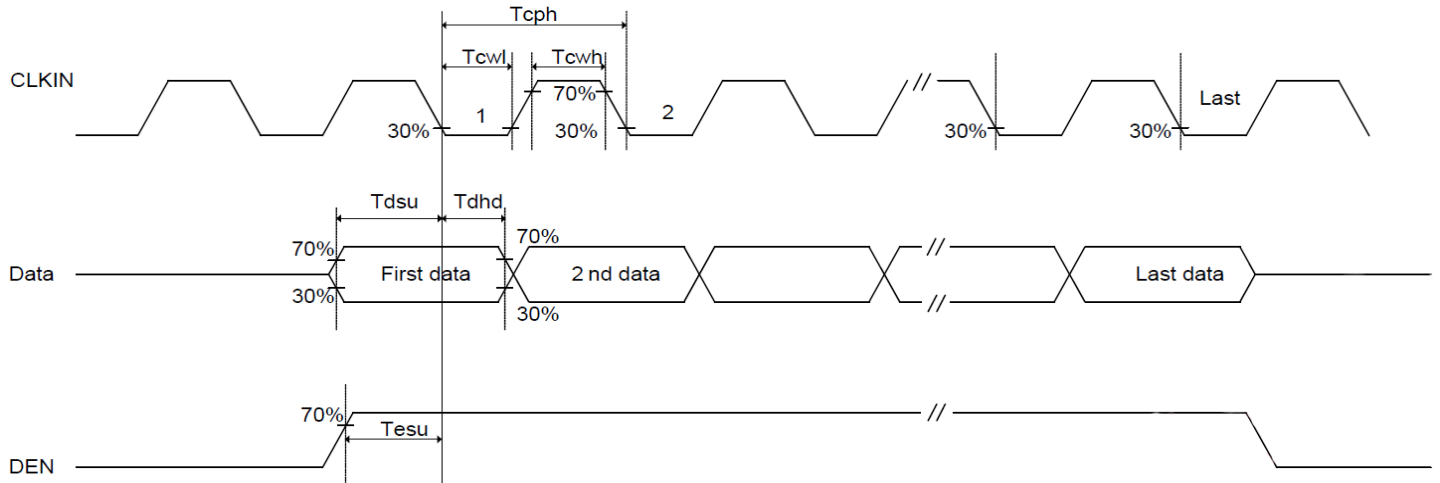
DE Mode Timing Diagram



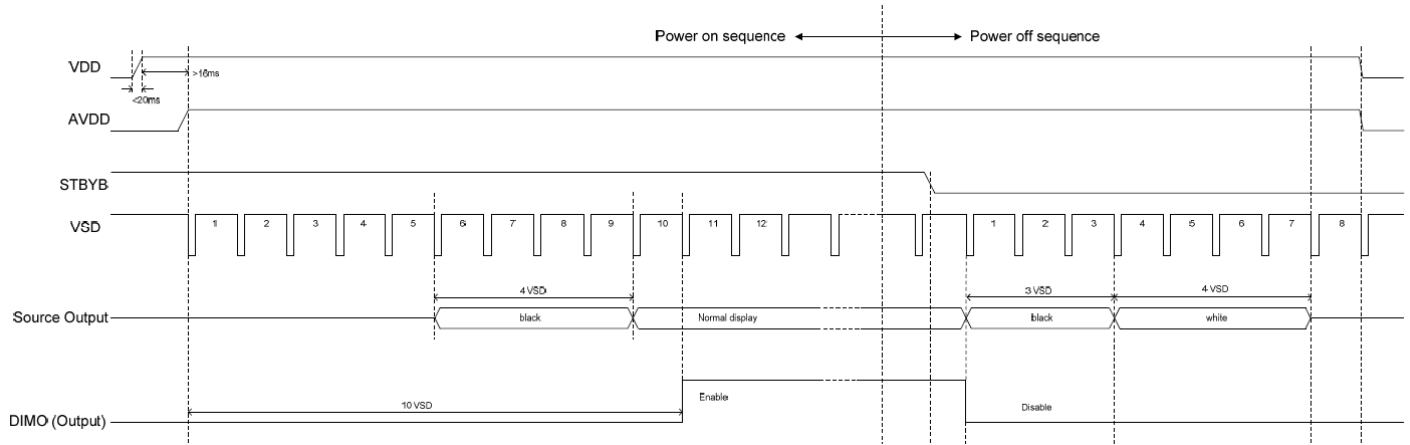
Input Setup Timing Requirements

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
V _{DD} Power Source Slew Time	T _{por}	-	-	20	ms	From 0V to 90% V _{DD}
CLK cycle time	T _{cph}	25	-	-	ns	-
CLK pulse duty	T _{cwh}	40	50	60	%	-
Data setup time	T _{dsu}	8	-	-	ns	-
Data hold time	T _{dhd}	8	-	-	ns	-
DEN setup time	T _{esu}	8	-	-	ns	-
DEN hold time	T _{ehd}	8	-	-	ns	-

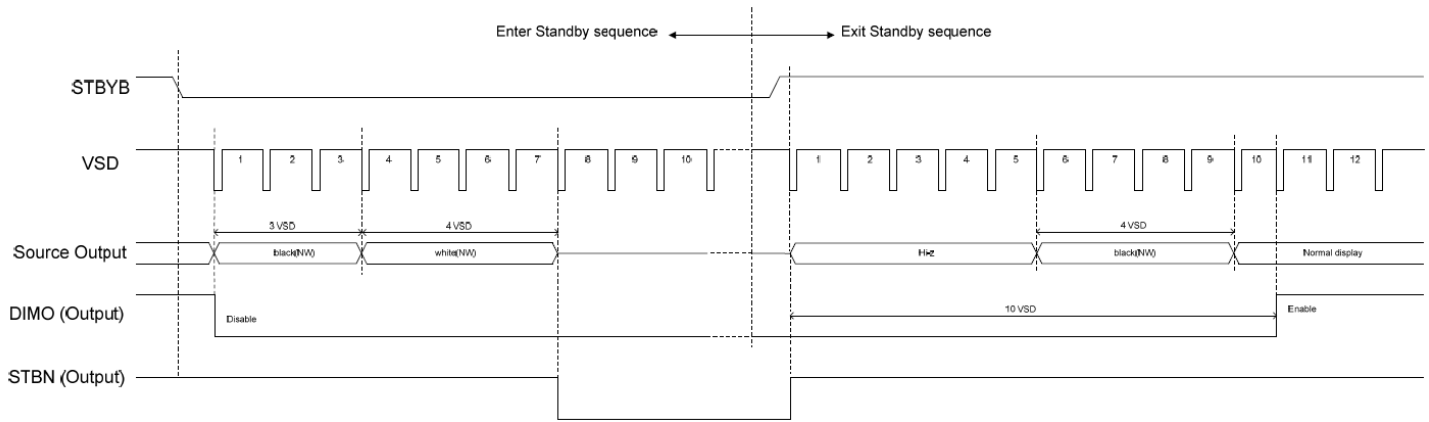
Input Setup Timing Diagram



Power ON/OFF Sequence



Enter/Exit Standby Mode Sequence



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, 96 Hrs.	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C, 96 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, 96 Hrs.	2
Low Temperature Operation	Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time.	-20°C, 96 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.	+60°C, 90% RH , 96 Hrs.	1,2
Thermal Shock resistance	Endurance test applying the electric stress (voltage & current) during a cycle of low and high thermal stress.	-20°C,30min -> 25°C,5min -> 70°C,30min -> 25°C,5min = 1 cycle, 10 cycles	-
Vibration test	Endurance test applying vibration to simulate transportation and use.	10-55Hz, 1.5mm amplitude. 2 hours. Each Direction X, Y, Z	3
Static electricity test	Endurance test applying electric static discharge.	Air: $V_s = \pm 8KV$, Contact: $V_s = \pm 4KV$ For 5 times each.	-

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

See Terms & Conditions at http://www.newhavendisplay.com/index.php?main_page=terms