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# NHD-4.3-480272EF-ATXL#

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

NHD-	Newhaven Display
4.3-	4.3" Diagonal
480272-	480xRGBx272 pixels
EF-	Model
A-	Built-in driver / NO Controller
T-	White LED backlight
X-	TFT
L-	6:00 optimum view, Wide Temp
#-	<b>RoHS Compliant</b>

### **Newhaven Display International, Inc.**

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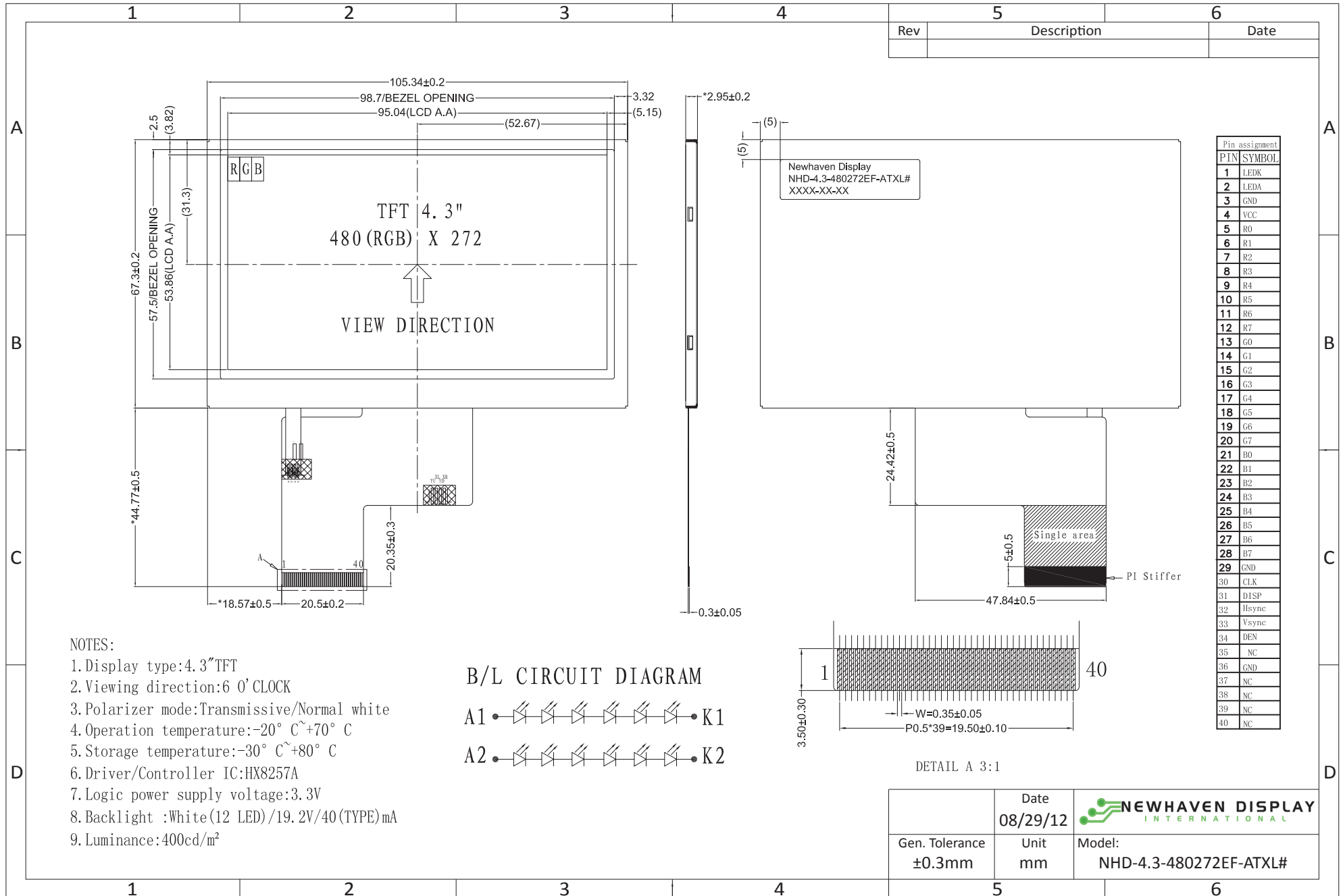
## Document Revision History

Revision	Date	Description	Changed by
0	8/29/2012	Initial Release	AK

## Functions and Features

- 480xRGBx272 resolution, up to 16.7M colors
- 12-LED backlight
- 24 bit RGB interface
- Resistive and Capacitive touch panel available

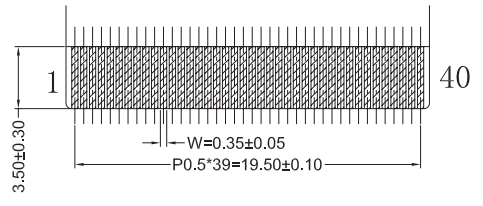
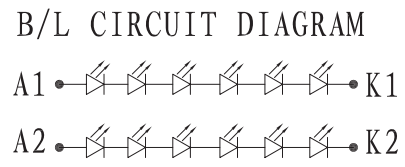
# Mechanical Drawing



Rev	Description	Date

Pin assignment	
PIN	SYMBOL
1	LEDK
2	LEDA
3	GND
4	VCC
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	CLK
31	DISP
32	Hsync
33	Vsync
34	DEN
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

- NOTES:
1. Display type: 4.3" TFT
  2. Viewing direction: 6 O' CLOCK
  3. Polarizer mode: Transmissive/Normal white
  4. Operation temperature: -20° C ~ +70° C
  5. Storage temperature: -30° C ~ +80° C
  6. Driver/Controller IC: HX8257A
  7. Logic power supply voltage: 3.3V
  8. Backlight : White (12 LED) / 19.2V/40 (TYPE) mA
  9. Luminance: 400cd/m<sup>2</sup>



	Date 08/29/12	
Gen. Tolerance ±0.3mm	Unit mm	

## Pin Description

Pin No.	Symbol	External Connection	Function Description
1	LED-	LED Power Supply	Ground for Backlight
2	LED+	LED Power Supply	Backlight Power Supply (32mA @ 19.2V)
3	GND	Power Supply	Ground
4	VDD	Power Supply	Power supply 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	PCLK	MPU	Data sample Clock signal
31	DISP	MPU	Display ON/OFF signal
32	HSYNC	MPU	Line synchronization signal
33	VSYNC	MPU	Frame synchronization signal
34	DE	MPU	Data Enable signal
35	AVDD	-	No Connect
36	GND	Power Supply	Ground
37	XR	-	No Connect
38	YD	-	No Connect
39	XL	-	No Connect
40	YU	-	No Connect

**Recommended LCD connector:** 0.5mm pitch 40-Conductor FFC. Molex p/n: 54132-4097

**Backlight connector:** on LCD connector      **Mates with:** ---

## Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	Top	Absolute Max	-20	-	+70	°C
Storage Temperature Range	Tst	Absolute Max	-30	-	+80	°C
Supply Voltage	VDD		3.0	3.3	3.6	V
Supply Current (White screen)	IDD		-	24.24	28.78	mA
Supply Current (Black screen)	IDD		-	25.76	30.30	mA
"H" level input	Vih		0.8*VDD	-	VDD	V
"L" level input	Vil		VSS	-	0.2*VDD	V
Backlight Supply Voltage	VLED		-	19.2	22	V
Backlight Supply Current	ILED		-	32	40	mA
Backlight Power Consumption	PBL		-	650	-	mW

## Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle – Top		Cr ≥10	-	15	-	°
Viewing Angle – Bottom			-	35	-	°
Viewing Angle – Left			-	45	-	°
Viewing Angle – Right			-	45	-	°
Contrast Ratio	Cr		-	400	-	
Luminance	YL		400	-	600	cd/m <sup>2</sup>
Response Time	Tr+Tf	-	-	20	45	ms

## Driver Information

Built-in Himax HX8257-A

Please download specification at [http://www.newhavendisplay.com/app\\_notes/HX8257.pdf](http://www.newhavendisplay.com/app_notes/HX8257.pdf)

## Timing Characteristics

### Parallel RGB input timing requirement

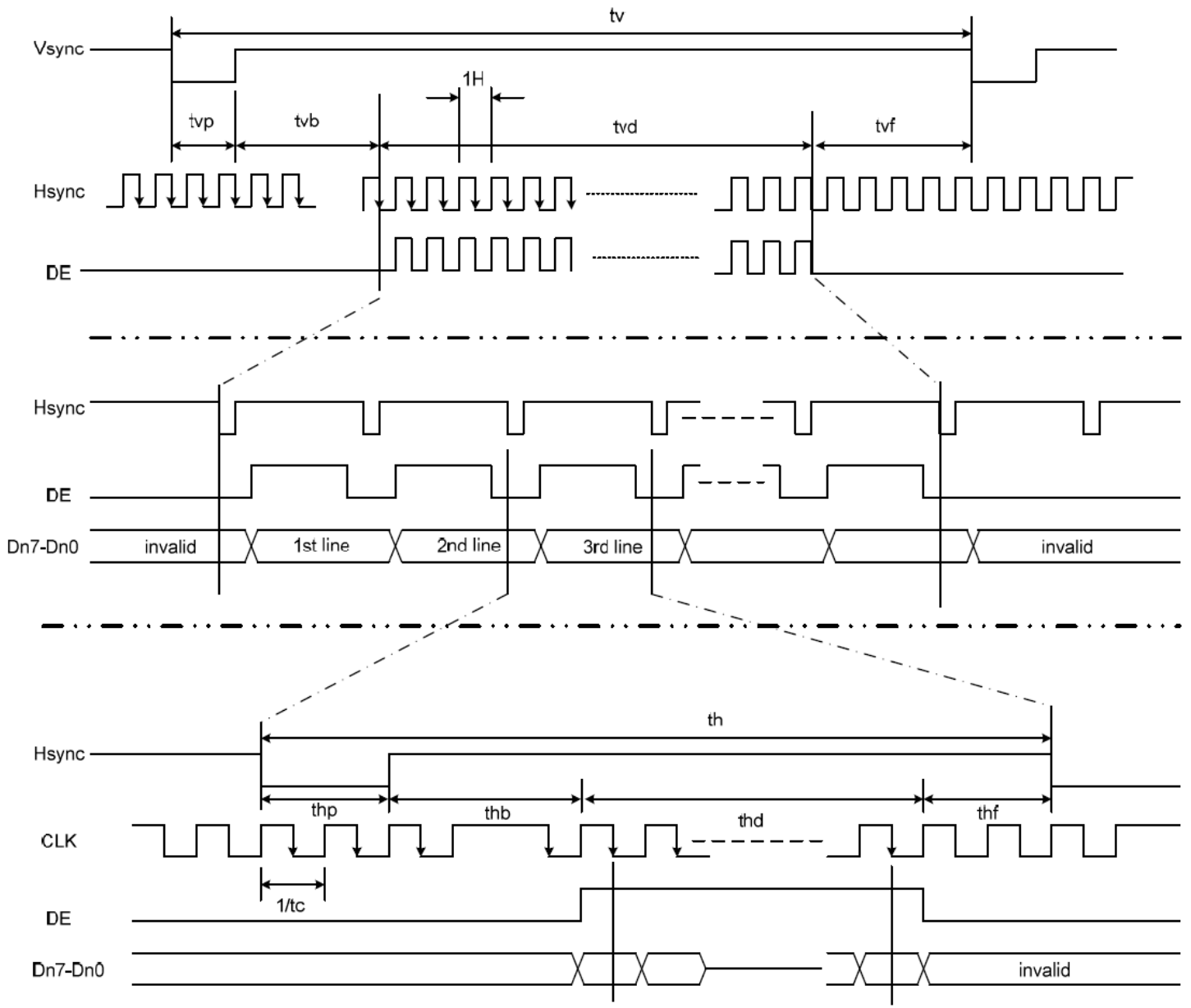
(480R GBx272,  $T_A=25^\circ\text{C}$ ,  $V_{DDIO}=1.8\text{V}$  to  $3.6\text{V}$ ,  $DVSS=0\text{V}$ )

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Clock cycle	$f_{\text{CLK}}^{(1)}$	-	9	15	MHz
Hsync cycle	$1/\text{th}$	-	17.14	-	KHz
Vsync cycle	$1/\text{tv}$	-	59.94	-	Hz
Horizontal Signal					
Horizontal cycle	th	525	525	605	CLK
Horizontal display period	thd	480	480	480	CLK
Horizontal front porch	thf	2	2	82	CLK
Horizontal pulse width	$\text{thp}^{(2)}$	2	41	41	CLK
Horizontal back porch	$\text{thb}^{(2)}$	2	2	41	CLK
Vertical Signal					
Vertical cycle	tv	285	286	511	$\text{H}^{(1)}$
Vertical display period	tvd	272	272	272	$\text{H}^{(1)}$
Vertical front porch	tvf	1	2	227	$\text{H}^{(1)}$
Vertical pulse width	$\text{tvp}^{(2)}$	1	10	11	$\text{H}^{(1)}$
Vertical back porch	$\text{tvb}^{(2)}$	1	2	11	$\text{H}^{(1)}$

Note: (1) Unit:  $\text{CLK}=1/f_{\text{CLK}}$ ,  $\text{H}=\text{th}$ ,

(2) It is necessary to keep  $\text{tvp}+\text{tvb}=12$  and  $\text{thp}+\text{thb}=43$  in sync mode. DE mode is unnecessary to keep it.







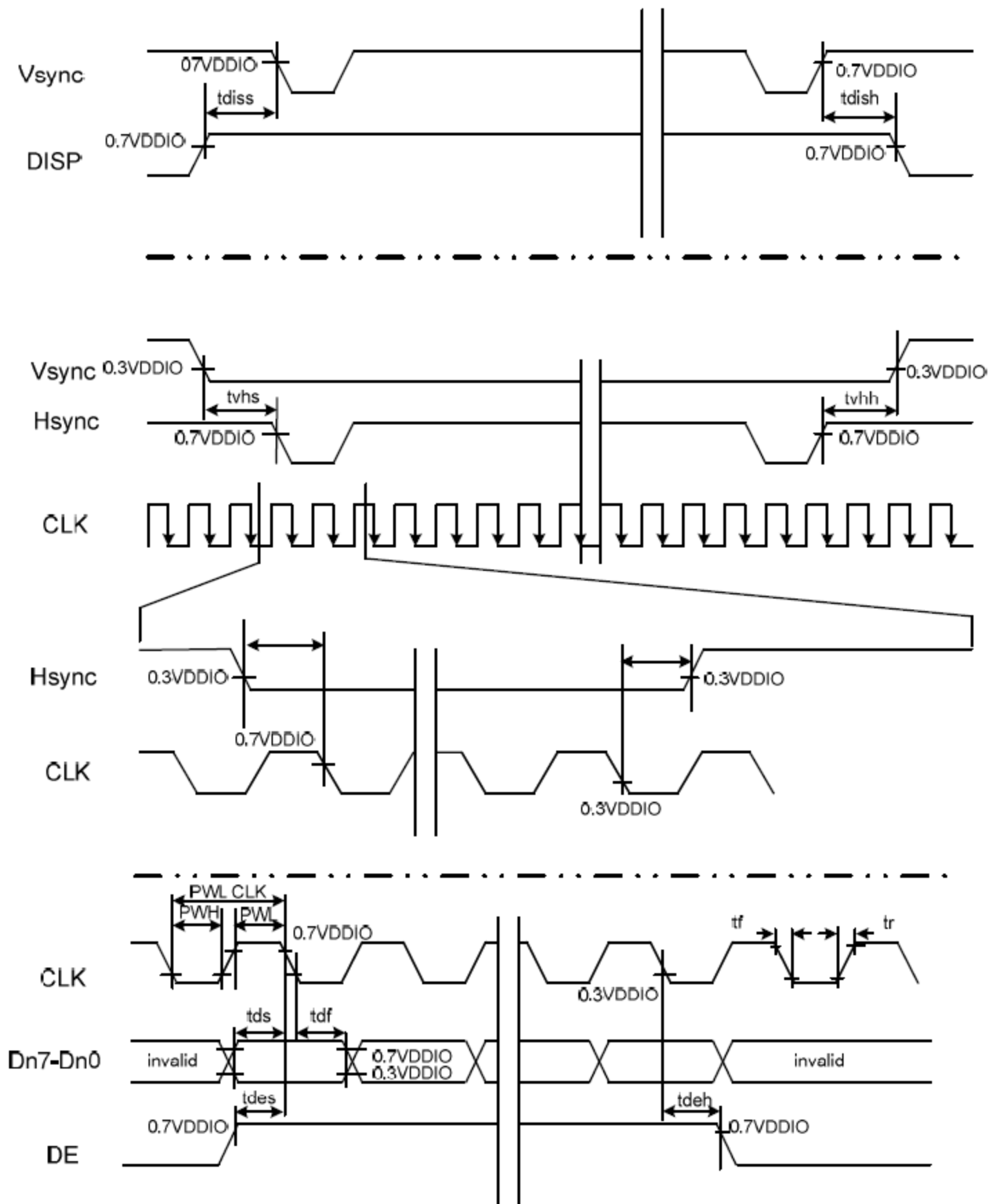
## Input setup timing requirement

( $T_A=25^\circ\text{C}$ ,  $V_{DDIO}=1.8\text{V}$  to  $3.6\text{V}$ ,  $DVSS = 0\text{V}$ ,  $t_r^{(1)}=t_f^{(1)}=2\text{ns}$ )

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DIS P setup time	$t_{dis}$	10	-	-	ns
DIS P hold time	$t_{dis h}$	10	-	-	ns
Clock period	$PW_{CLK}^{(2)}$	66.7	-	-	ns
Clock pulse high period	$PWH^{(2)}$	26.7	-	-	ns
Clock pulse low period	$PWL^{(2)}$	26.7	-	-	ns
Hsync setup time	$t_{hs}$	10	-	-	ns
Hsync hold time	$t_{hh}$	10	-	-	ns
Data setup time	$t_{ds}$	10	-	-	ns
Data hold time	$t_{dh}$	10	-	-	ns
DE setup time	$t_{des}$	10	-	-	ns
DE hold time	$t_{deh}$	10	-	-	ns
Vsync setup time	$t_{vhs}$	10	-	-	ns
Vsync hold time	$t_{vhh}$	10	-	-	ns

Note: (1)  $t_r$ ,  $t_f$  is defined 10% to 90% of signal amplitude.

(2) For parallel interface, maximum clock frequency is 15MHz.



## 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 , 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C , 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (voltage & current) and the high thermal stress for a long time.	+70°C 200hrs	2
Low Temperature Operation	Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time.	-20°C , 200hrs	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 , 96hrs	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 = 1 cycle 10 cycles	
Vibration test	Endurance test applying vibration to simulate transportation and use.	10-55Hz , 15mm amplitude. 60 sec in each of 3 directions X,Y,Z For 15 minutes	3
Static electricity test	Endurance test applying electric static discharge.	VS=800V, RS=1.5kΩ, CS=100pF One time	

**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](http://www.newhavendisplay.com/specs/precautions.pdf)

## Warranty Information and Terms & Conditions

[http://www.newhavendisplay.com/index.php?main\\_page=terms](http://www.newhavendisplay.com/index.php?main_page=terms)