

# NHD-4.3-480272EF-ASXV#

## 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
S-	High Brightness, White LED Backlight
X-	TFT
V-	MVA Type, Wide Temperature
#-	<b>RoHS Compliant</b>

### Newhaven Display International, Inc.

2661 Galvin Ct.

Elgin IL, 60124

Ph: 847-844-8795

Fax: 847-844-8796

[www.newhavendisplay.com](http://www.newhavendisplay.com)

[nhtech@newhavendisplay.com](mailto:nhtech@newhavendisplay.com)

[nhsales@newhavendisplay.com](mailto:nhsales@newhavendisplay.com)

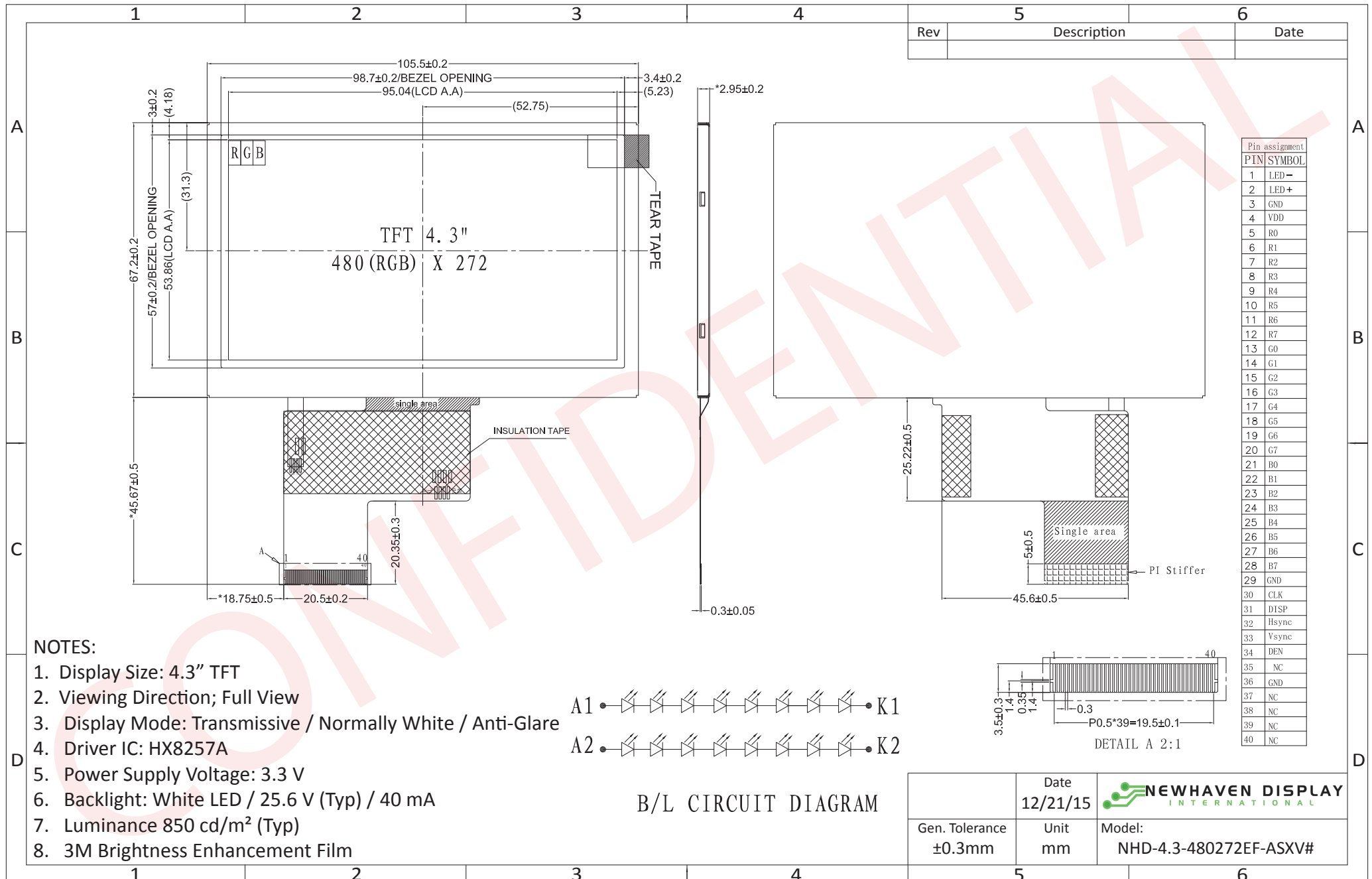
## Document Revision History

Revision	Date	Description	Changed by
0	4/29/2014	Initial Release	ML
1	6/24/2014	Timing characteristics updated	ML
2	8/11/15	Part number changed from ATXV#-3 to ASXV#	AK
3	12/21/15	Added Backlight Lifetime Rating, Datasheet Reformat	SB

## Functions and Features

- 480xRGBx272 resolution, up to 16.7M colors
- 16-LED backlight
- 24 bit RGB interface
- Wide viewing angle from all sides
- Resistive and Capacitive touch panel available

# Mechanical Drawing



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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 (40mA @ 25.6V)
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	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	NC	-	No Connect
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-pin FFC.

**Molex p/n:** 54104-4031

**Backlight connector:** on LCD connector

## 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	IDD	VDD = 3.3 V	10	28	50	mA
"H" level input	Vih	-	0.8*VDD	-	VDD	V
"L" level input	Vil	-	GND	-	0.2*VDD	V
"H" level output	Voh	-	0.9*VDD	-	VDD	V
"L" level output	Vol	-	GND	-	0.1*VDD	V
Backlight Supply Voltage	VLED	-	23.2	25.6	28	V
Backlight Supply Current	ILED	VLED = 25.6V	-	40	-	mA
Backlight Lifetime*	-	ILED = 40 mA Top = 25° C	20,000	50,000	-	Hrs.

\*Backlight lifetime is rates as Hours until **half-brightness**, under normal operating conditions.

## Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Optimal Viewing Angles	Top	Cr ≥ 10	60	75	-	°
	Bottom		60	75	-	°
	Left		60	75	-	°
	Right		60	75	-	°
Contrast Ratio	Cr	-	400	500	-	-
Luminance	Lv	-	680	850	-	cd/m <sup>2</sup>
Response Time	Rise	Tr	-	25	30	ms
	Fall	Tf	-	25	30	ms

## Driver Information

Built-in Himax HX8257-A driver.

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

## Timing Characteristics

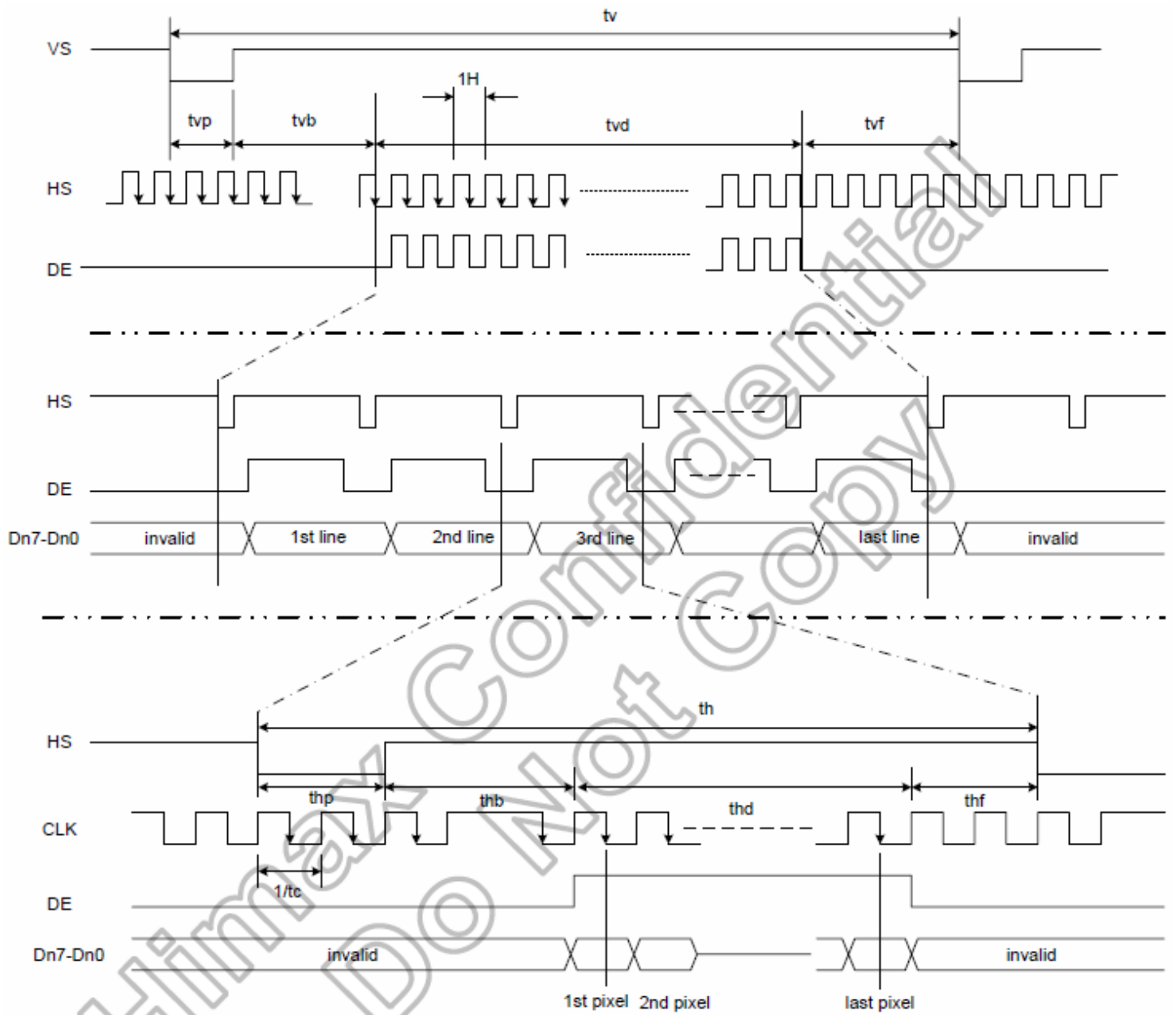
### Parallel RGB input timing requirement

(480RGBx272,  $T_A=25^\circ\text{C}$ ,  $V_{DDIO}=1.8\text{V to }3.6\text{V}$ ,  $DVSS=0\text{V}$ )

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	399	$\text{H}^{(1)}$
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

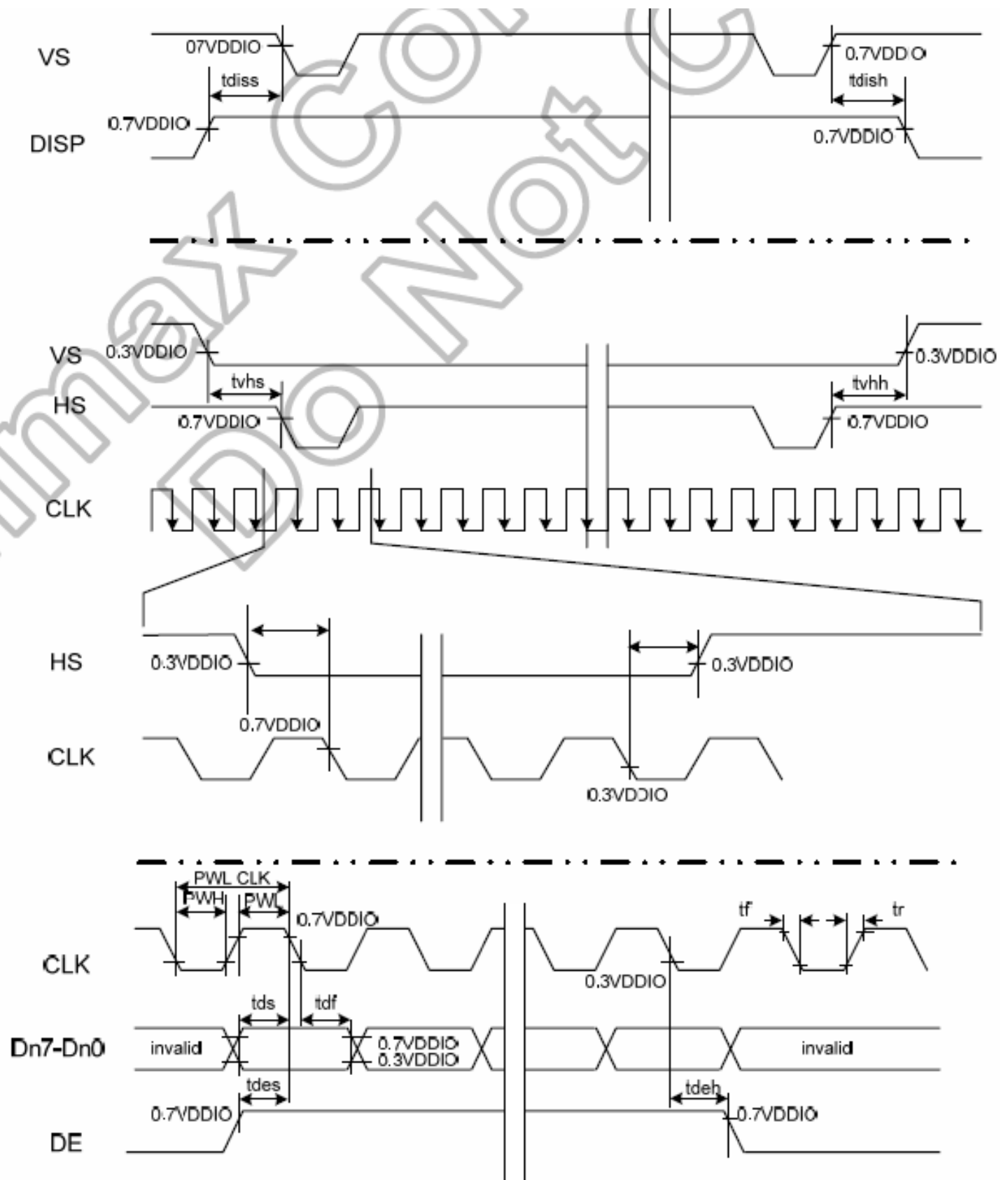
( $T_A=25^{\circ}\text{C}$ ,  $V_{DDIO}=1.8\text{V}$  to  $3.6\text{V}$ ,  $DV_{SS}=0\text{V}$ ,  $t_r^{(1)}=t_f^{(1)}=2\text{ns}$ )

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DISP setup time	$t_{diss}$	10	-	-	ns
DISP hold time	$t_{dish}$	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 , 96hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C , 96hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (voltage & current) and the high thermal stress for a long time.	+70°C , 96hrs	2
Low Temperature Operation	Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time.	-20°C , 96hrs	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

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



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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.