

NHD-4.3-480272EF-ASXN#

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-	Sunlight Readable
X-	TFT
N-	TN, 6:00 Optimal View, Wide Temperature
#-	RoHS Compliant

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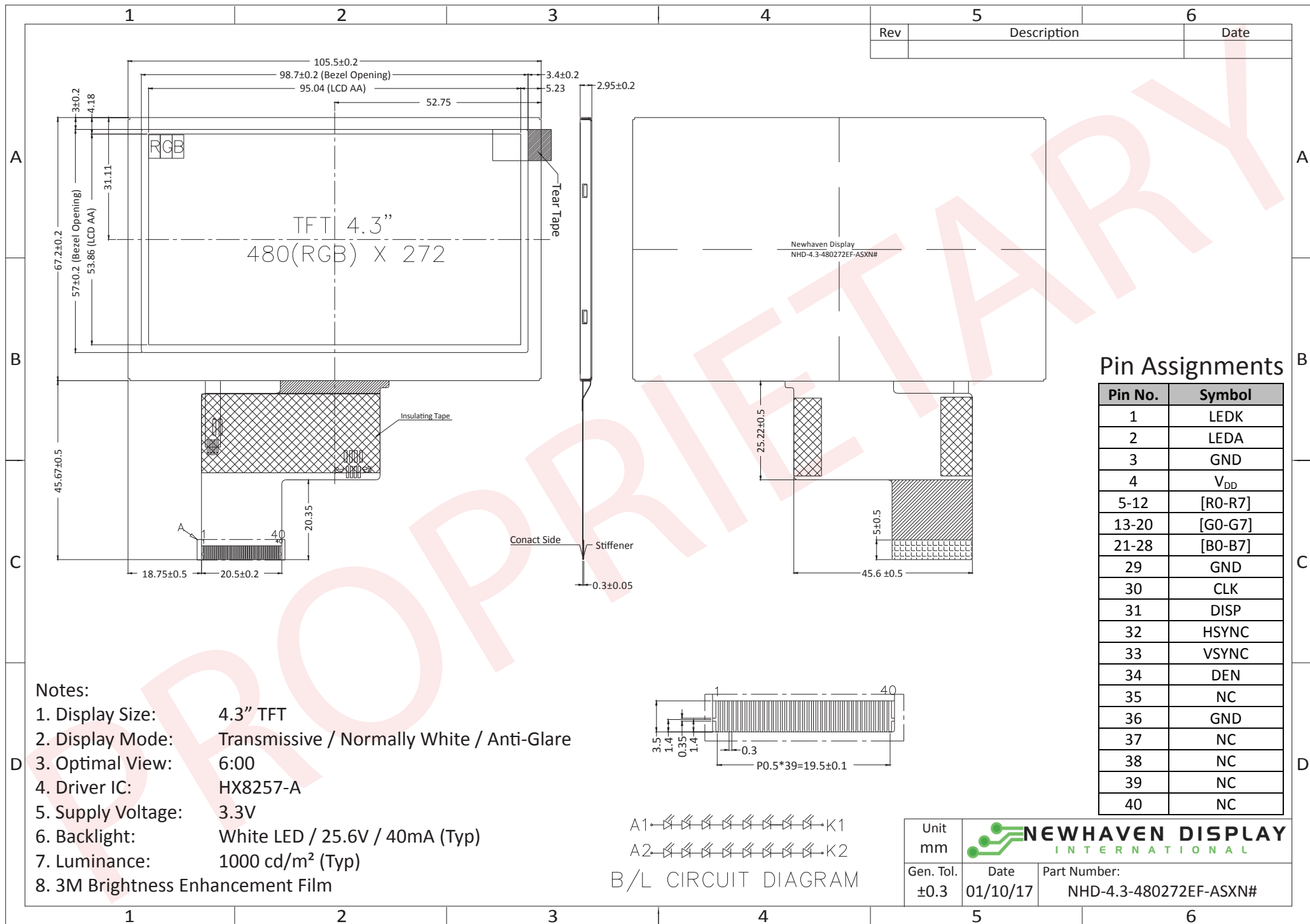
Document Revision History

Revision	Date	Description	Changed by
0	09/22/15	Initial Release	SB
1	1/10/17	Mechanical Drawing, Electrical & Optical Char. Updated	SB

Functions and Features

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

Mechanical Drawing

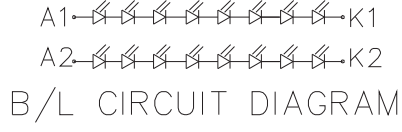


Rev	Description	Date

Pin Assignments

Pin No.	Symbol
1	LEDK
2	LEDA
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	NC
36	GND
37	NC
38	NC
39	NC
40	NC

- Notes:
1. Display Size: 4.3" TFT
 2. Display Mode: Transmissive / Normally White / Anti-Glare
 3. Optimal View: 6:00
 4. Driver IC: HX8257-A
 5. Supply Voltage: 3.3V
 6. Backlight: White LED / 25.6V / 40mA (Typ)
 7. Luminance: 1000 cd/m² (Typ)
 8. 3M Brightness Enhancement Film



Unit mm	NEWHAVEN DISPLAY INTERNATIONAL	
Gen. Tol. ±0.3	Date 01/10/17	Part Number: NHD-4.3-480272EF-ASXN#

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	V _{DD}	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	DEN	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-Conductor FFC. Molex p/n: 54132-4062

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

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}	-	3.0	3.3	3.6	V
Supply Current	I _{DD}	V _{DD} = 3.3V	14	28	56	mA
“H” level input	V _{IH}	-	0.8 * V _{DD}	-	V _{DD}	V
“L” level input	V _{IL}	-	GND	-	0.3 * V _{DD}	V
“H” level output	V _{OH}	-	0.9 * V _{DD}	-	V _{DD}	V
“L” level output	V _{OL}	-	GND	-	0.1 * V _{DD}	V
Backlight Supply Voltage	V _{LED}	-	23.2	25.6	26.4	V
Backlight Supply Current	I _{LED}	V _{LED} = 25.6V	30	40	50	mA
Backlight Lifetime*	-	I _{LED} = 40mA T _{OP} = 25°C	20,000	50,000	-	Hrs.

*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	CR ≥ 10	-	50	-	°	
	Bottom		-	60	-	°	
	Left		-	60	-	°	
	Right		-	60	-	°	
Contrast Ratio	CR	-	400	500	-	-	
Luminance	L _V	I _{LED} = 40mA	800	1000	-	cd/m ²	
Response Time	Rise + Fall	T _R + T _F	T _{OP} = 25°C	-	25	30	ms

Driver Information

Built-in Himax HX8257-A driver.

Please download specification at http://www.newhavendisplay.com/app_notes/HX8257.pdf

Timing Characteristics

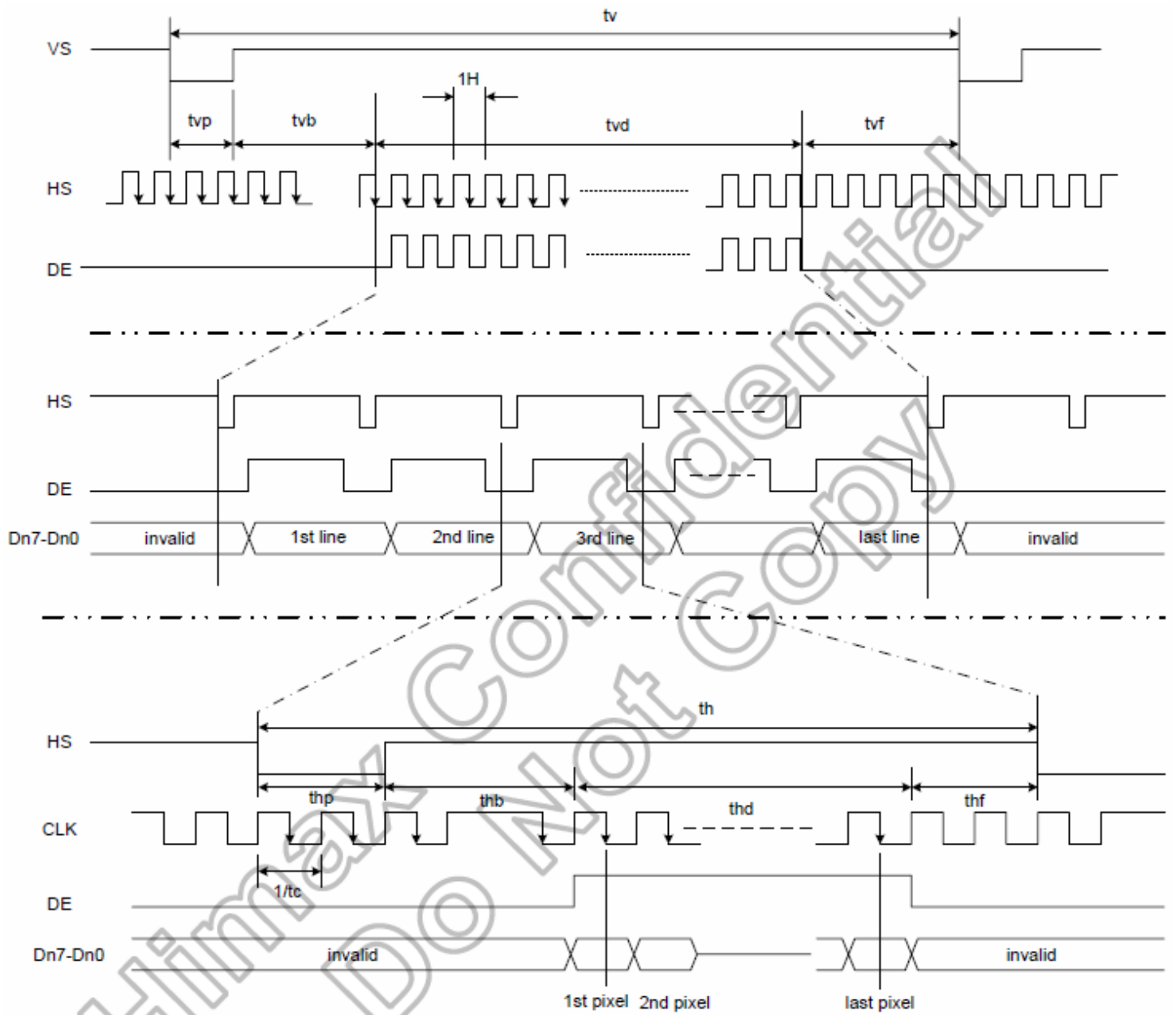
Parallel RGB input timing requirement

(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/th	-	17.14	-	KHz
Vsync cycle	1/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	thp ⁽²⁾	2	41	41	CLK
Horizontal back porch	thb ⁽²⁾	2	2	41	CLK
Vertical Signal					
Vertical cycle	tv	285	286	399	H ⁽¹⁾
Vertical display period	tvd	272	272	272	H ⁽¹⁾
Vertical front porch	tvf	1	2	227	H ⁽¹⁾
Vertical pulse width	tvp ⁽²⁾	1	10	11	H ⁽¹⁾
Vertical back porch	tvb ⁽²⁾	1	2	11	H ⁽¹⁾

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

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



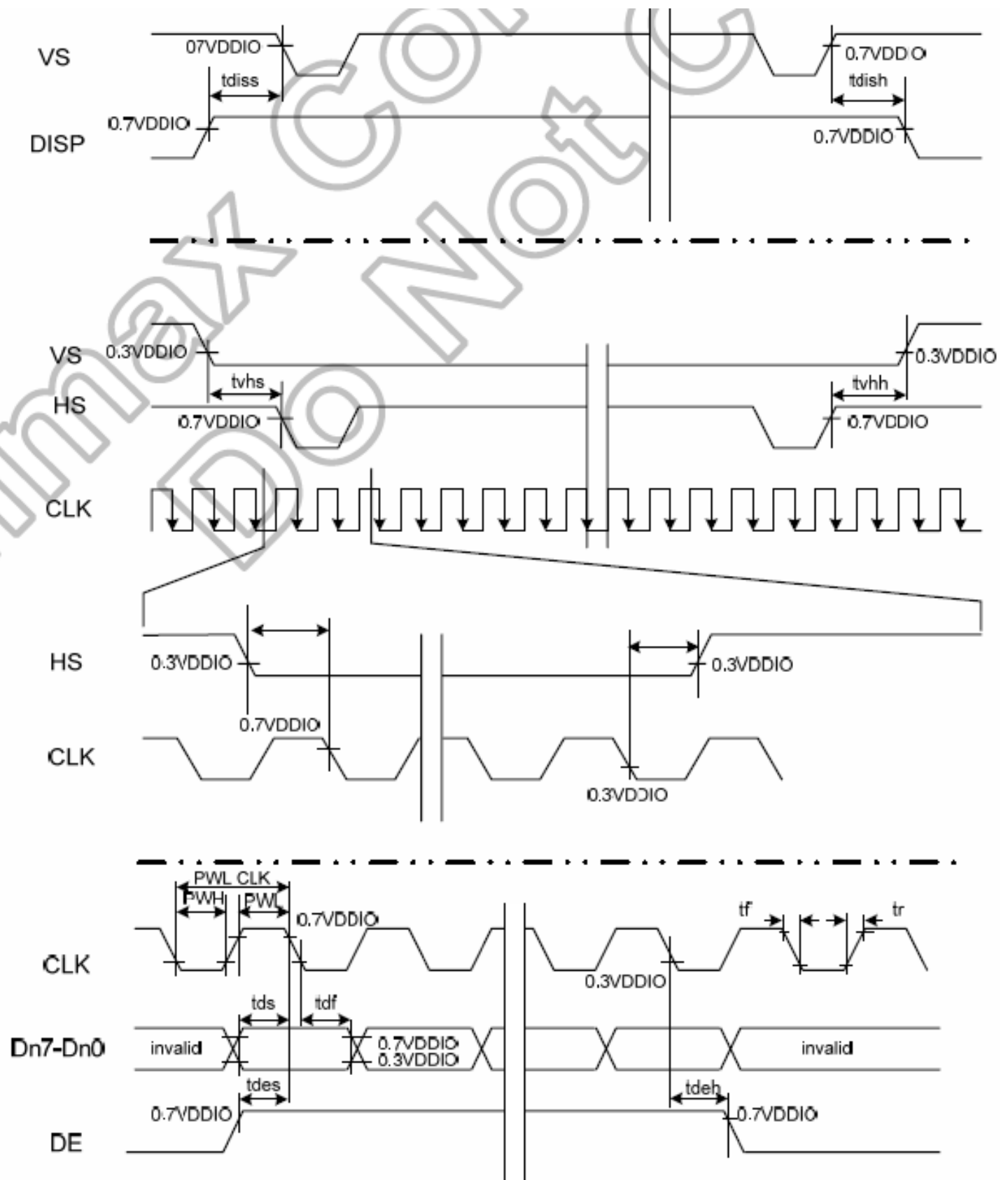
Input setup timing requirement

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

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.	V _s =8KV, R _s =330Ω, C _s =150pF 5 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.

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