

NHD-7.0-800480EF-ASXN#-T

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

NHD-	Newhaven Display
7.0-	7.0" Diagonal
800480-	800x480 Pixels
EF-	Model
A-	Built-in Driver / No Controller
S-	Sunlight Readable
X-	TFT
N-	TN, Wide Temperature
#-	RoHS Compliant
T-	Resistive Touch Panel

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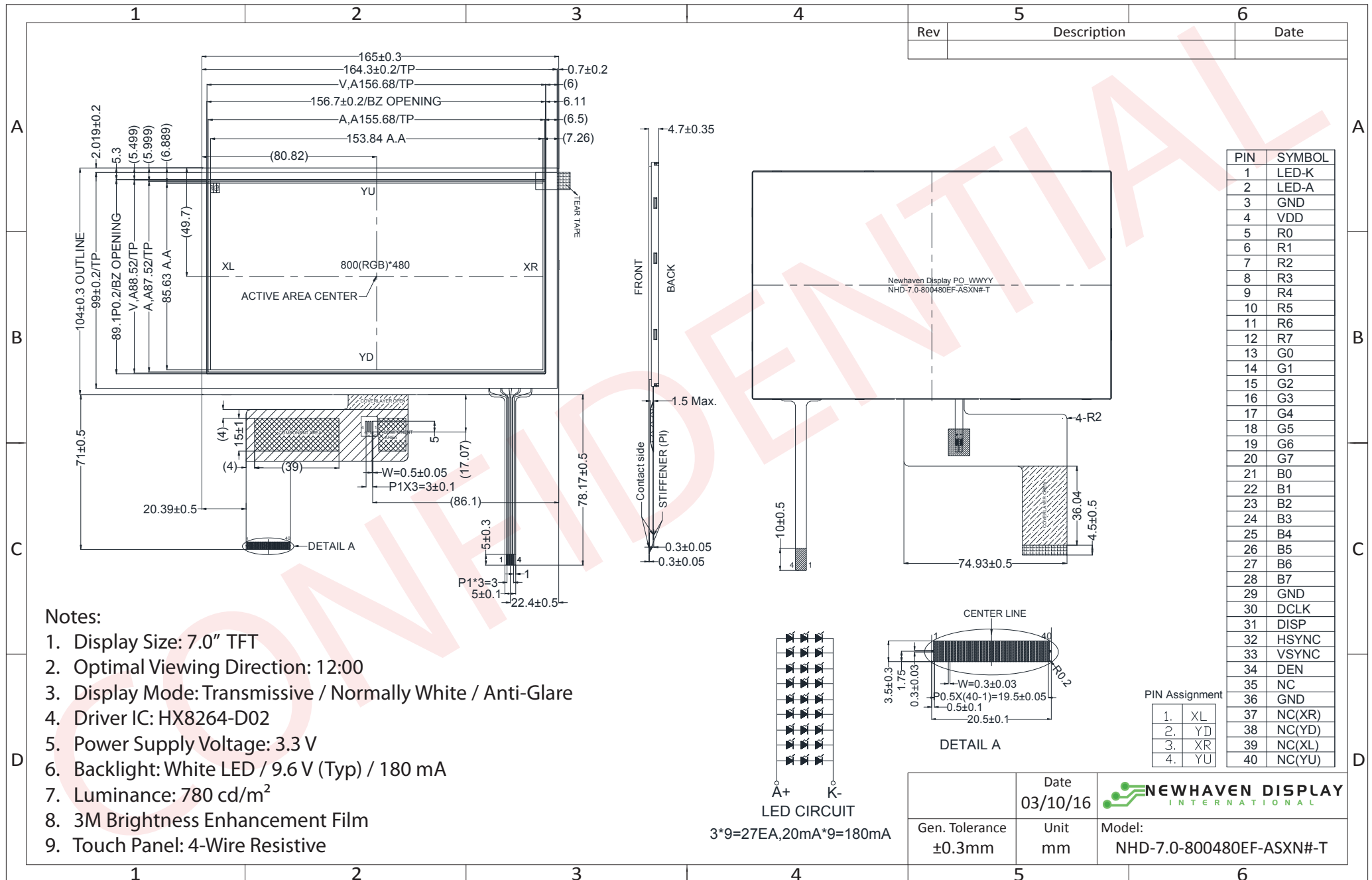
Document Revision History

Revision	Date	Description	Changed by
0	3/10/16	Initial Release	SB

Functions and Features

- 800x480 resolution
- LED backlight
- 24-bit digital RGB interface
- 16.7M colors
- Sunlight Readable
- 4-wire resistive Touch Panel

Mechanical Drawing



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Pin Description

TFT:

Pin No.	Symbol	Connection	Function Description
1	LED_K	Power Supply	Backlight Cathode (Ground)
2	LED_A	Power Supply	Backlight Anode (180mA @ 9.6V)
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	DCLK	MPU	Dot data Clock
31	DISP	MPU	Display on/off DISP=1:Display on
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(XR)	-	No Connect
38	NC(YD)	-	No Connect
39	NC(XL)	-	No Connect
40	NC(YU)	-	No Connect

Recommended connector: 0.5mm pitch 40-Conductor FFC. Molex p/n: 54104-4031 (top contact)

Resistive Touch Panel:

Pin No.	Symbol	Connection	Function Description
1	XL	Touch Controller	Touch Panel – Left
2	YD	Touch Controller	Touch Panel – Down
3	XR	Touch Controller	Touch Panel – Right
4	YU	Touch Controller	Touch Panel – Up

Recommended connector: 1.0mm pitch 4-Conductor FFC. Molex p/n: 52207-0485 (top contact)

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=3.3V 25°C	60	85	120	mA
"H" Level Input	VIH	-	0.7*VDD	-	VDD	V
"L" Level Input	VIL	-	GND	-	0.3*VDD	V
"H" Level Output	VOH	-	VDD-0.4	-	-	V
"L" Level Output	VOL	-	-	-	GND+0.4	V
Backlight Supply Voltage	VLED	-	8.7	9.6	9.9	V
Backlight Supply Current	ILED	VLED=9.6V	-	180	-	mA
Backlight Lifetime*	-	ILED = 180 mA Top = 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	$\phi Y+$	Cr \geq 10	-	60	-	°
	Bottom	$\phi Y-$		-	50	-	°
	Left	$\theta X-$		-	60	-	°
	Right	$\theta X+$		-	60	-	°
Contrast Ratio	Cr	-	-	400	-	-	
Luminance	L	ILED = 180 mA	620	780	-	cd/m ²	
Response Time	Tr + Tf	-	-	25	35	ms	

Touch Panel Characteristics

Item	Min.	Typ.	Max.	Unit
Linearity	-3	-	3	%
Terminal Resistance – X-Axis	50	-	400	Ω
Terminal Resistance – Y-Axis	350	-	1100	Ω
Insulation Resistance	20	-	-	M Ω
Operating Voltage	-	-	10	V
Chattering	-	-	10	ms
Activation Force	10	-	100	g
Pen Writing Durability	100,000	-	-	Characters
Pitting Durability	1,000,000	-	-	Touches
Surface Hardness	3	-	-	H

Driver Information

Built-in HX8264-D02 Source Driver: http://www.newhavendisplay.com/app_notes/HX8264-D02.pdf

Built-in HX8664-B Gate Driver: http://www.newhavendisplay.com/app_notes/HX8664-B.pdf

Timing Characteristics

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
HS setup time	T_{hst}	8	-	-	ns
HS hold time	T_{hhd}	8	-	-	ns
VS setup time	T_{vst}	8	-	-	ns
VS hold time	T_{vhd}	8	-	-	ns
Data setup time	T_{dsu}	8	-	-	ns
Data hold time	T_{dhd}	8	-	-	ns
DE setup time	T_{esu}	8	-	-	ns
DE hold time	T_{ehd}	8	-	-	ns
VDD Power On Slew rate	T_{POR}	-	-	20	ms
RSTB pulse width	T_{Rst}	10	-	-	us
CLKIN cycle time	T_{cph}	20	-	-	ns
CLKIN pulse duty	T_{cwh}	40	50	60	%
Output stable time	T_{sst}	-	-	6	us

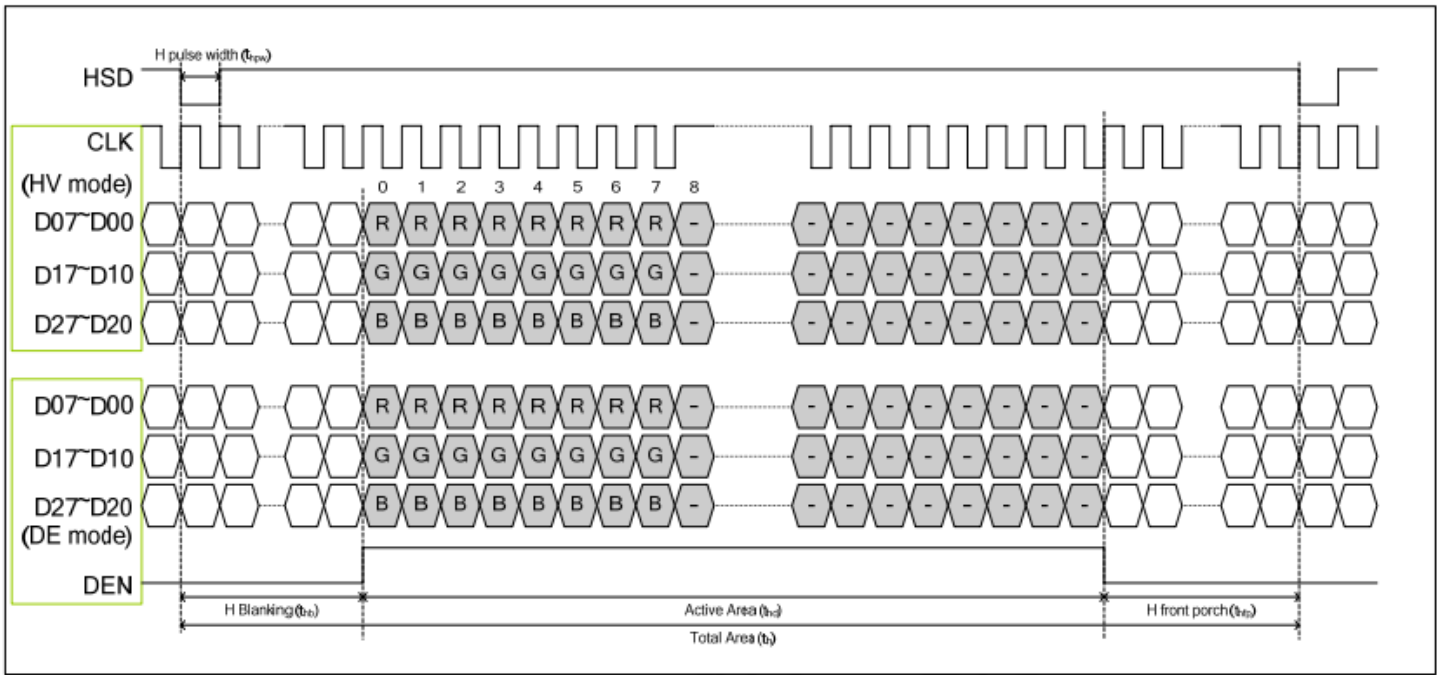
Horizontal Timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Horizontal Display Area	thd	800			DCLK
DCLK frequency	fclk	-	30	50	MHz
One Horizontal Line	th	889	928	1143	DCLK
HS pulse width	thpw	1	48	255	DCLK
HS Back Porch (Blanking)	thb	88			DCLK
HS Front Porch	thfp	1	40	255	DCLK
DE mode Blanking	th-thd	85	128	512	DCLK

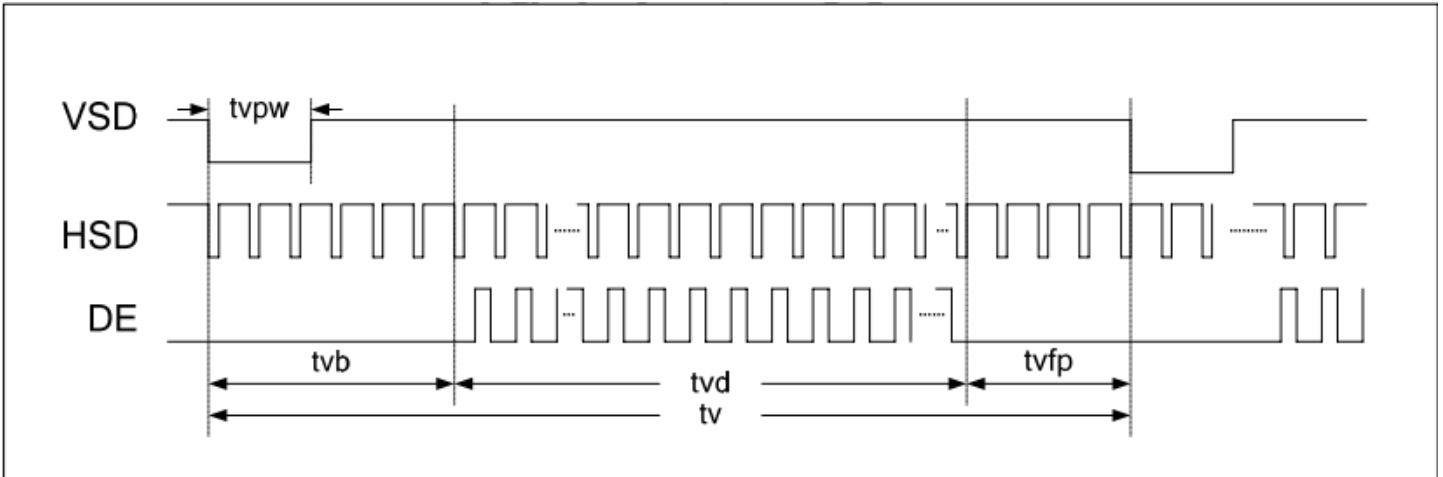
Vertical Timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd	480			T_H
VS period time	tv	513	525	767	T_H
VS pulse width	tvpw	3	3	255	T_H
VS Back Porch (Blanking)	tvb	32			T_H
VS Front Porch	tvfp	1	13	255	T_H
DE mode Blanking	tv-tvd	4	45	255	T_H

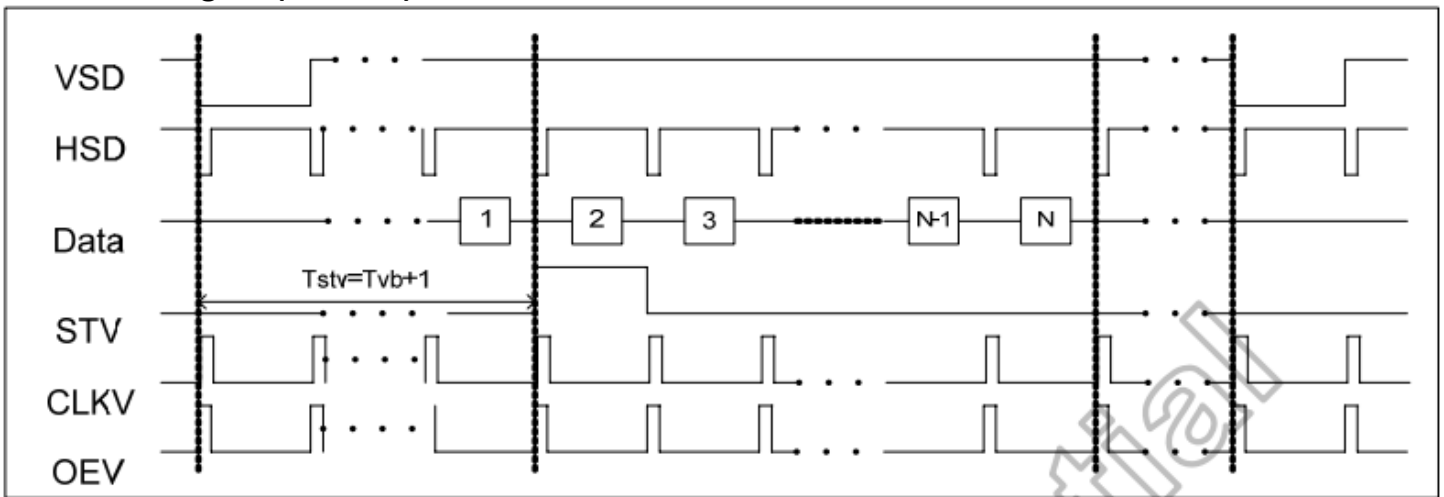
Horizontal Timing



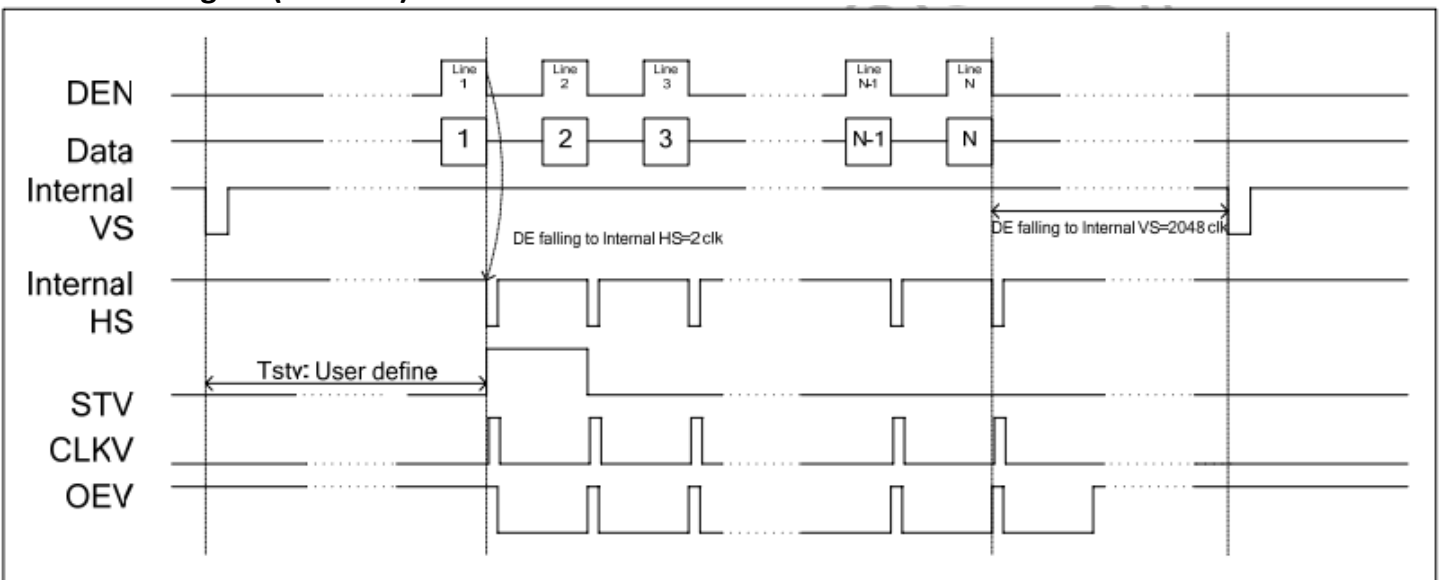
Vertical Timing



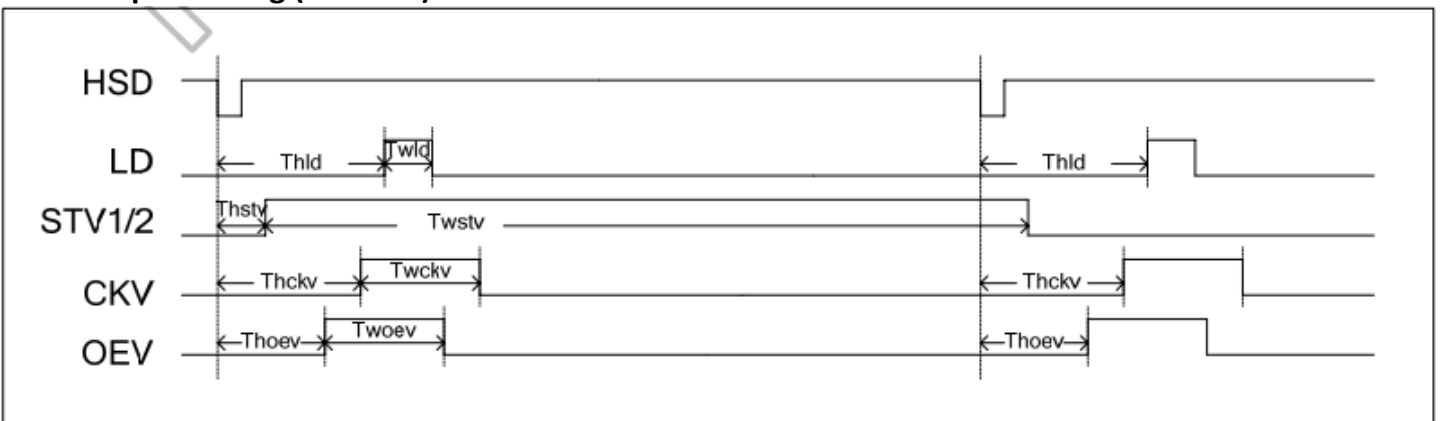
Vertical Timing HV (Cascade)



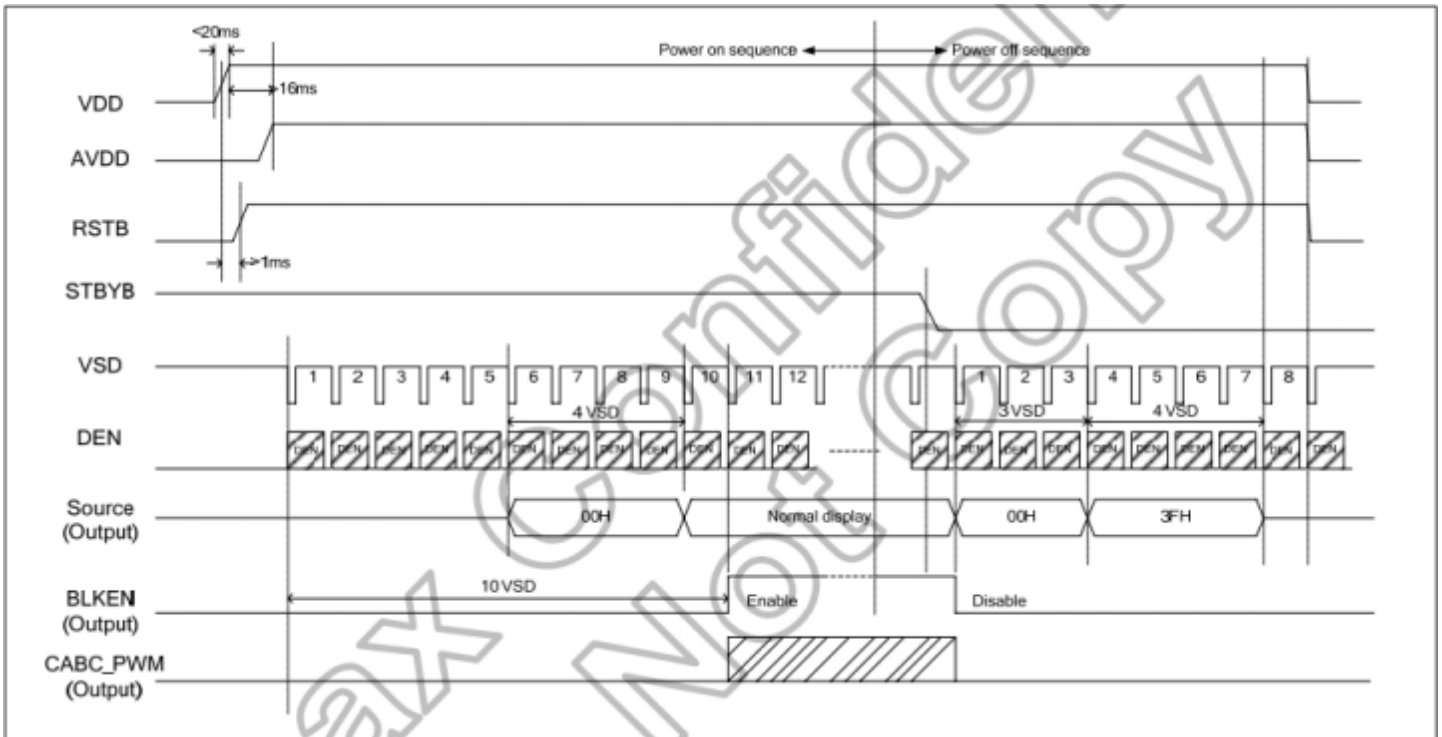
Vertical Timing DE (Cascade)



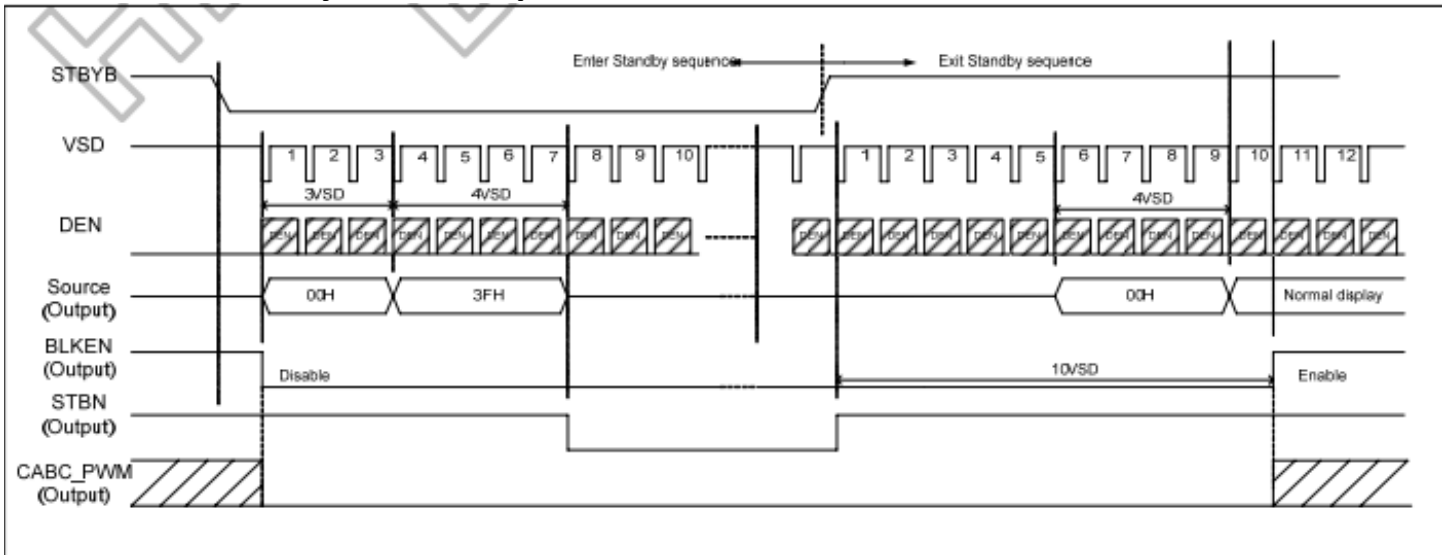
Gate Output Timing (Cascade)



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 , 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.	+50°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.	-30°C, 30min -> 80°C, 30min, Change time: 5min, 10 cycles	
Vibration test	Endurance test applying vibration to simulate transportation and use.	10-55Hz , 1.5mm 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

Warranty Information

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

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