NEWHAVEN DISPLAY INTERNATIONAL

Product Specification

NHD-4.3-800480CF-ASXP

TFT (Thin-Film-Transister) 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

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REACH Compliant

RoHS Compliant

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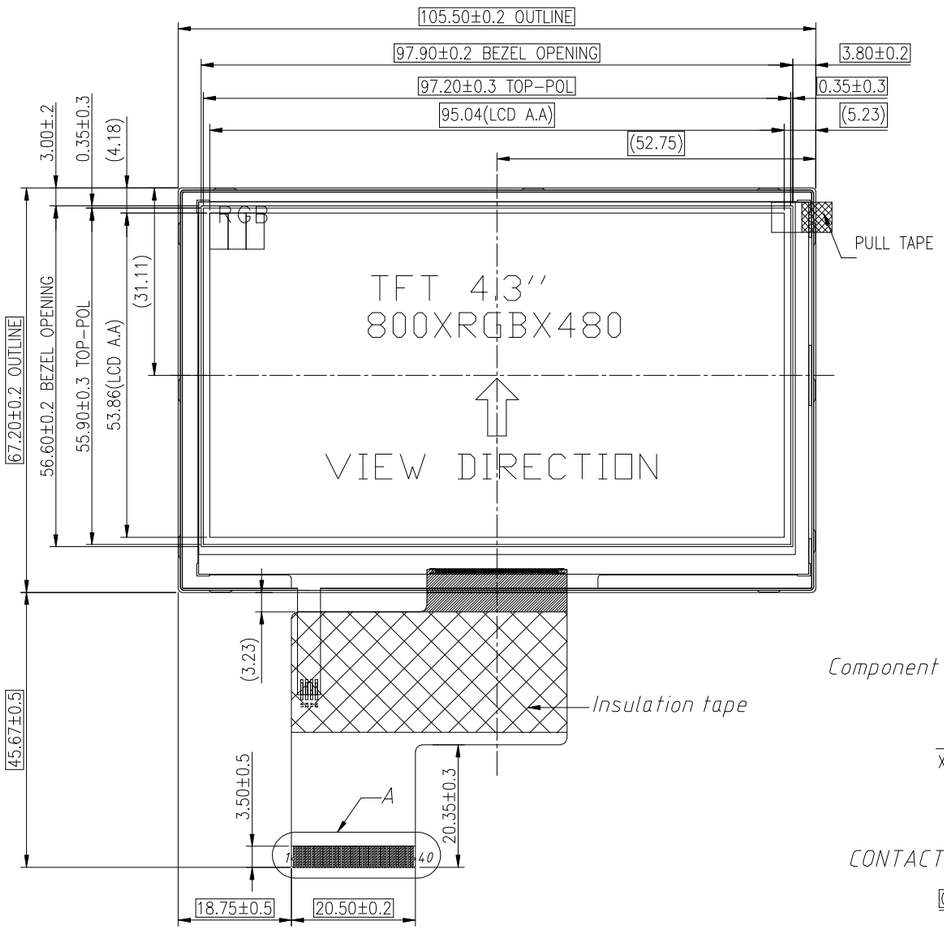
Additional Resources

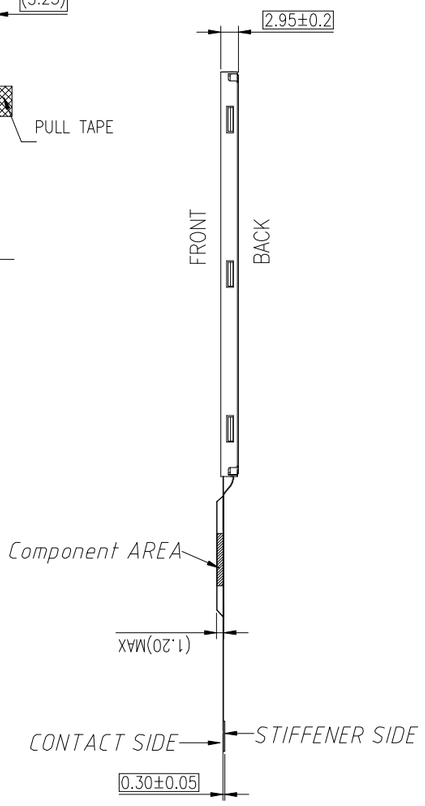
- **Support Forum:** https://support.newhavendisplay.com/hc/en-us/community/topics
- **GitHub:** https://github.com/newhavendisplay
- **Example Code:** https://support.newhavendisplay.com/hc/en-us/categories/4409527834135-Example-Code/
- **Knowledge Center:** https://www.newhavendisplay.com/knowledge_center.html
- **Quality Center:** https://www.newhavendisplay.com/quality_center.html
- **Precautions for using LCDs/LCMs:** https://www.newhavendisplay.com/specs/precautions.pdf
- **Warranty / Terms & Conditions:** https://www.newhavendisplay.com/terms.html

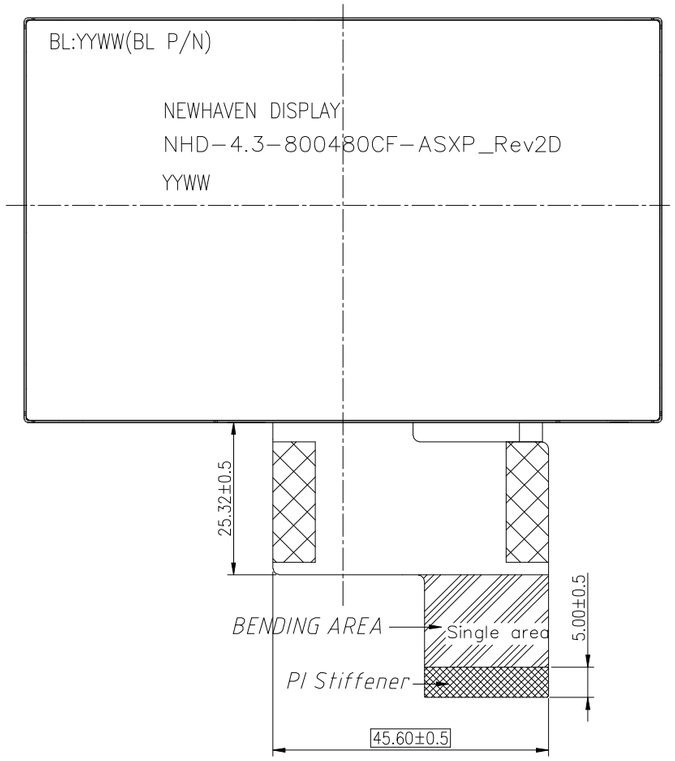
Document Revision History

Revision	Date	Description	Changed By
-	10/20/2019	Initial Release	PK
1	05/12/2020	Update to 2D Mechanical Drawing, Static Electricity Test Conditions	AS
2	10/13/2023	Date Code Format Updated on Mechanical Drawing	KL
3	06/24/2025	Updated Timing Characteristics	KL

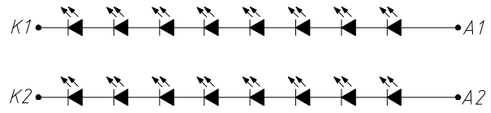
Mechanical Drawing





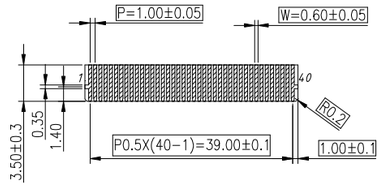


PIN	SYMBOL
1	V_{LEDK}
2	V_{LEDA}
3	GND
4	VCC
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	CLK
31	DISP
32	Hsync
33	Vsync
34	DEN
35	BIST
36	GND
37	NC(YU)
38	NC(XL)
39	NC(YD)
40	NC(XR)



WHITE LED 40mA/25.6V(TYP)

LED CIRCUIT DIAGRAM:



A Detail//Scale 2:1

Product Description: 4.3” 800x480 IPS TFT

1. Driver IC: EK9716B & EK73002AB2
2. Interface: 24-bit Parallel RGB
3. Power Requirement: 3.3V TFT, 25.6V/40mA Backlight
4. Optical Features: Normally Black, Transmissive, Anti-Glare, 850cd/m²
5. Recommended FFC Connector: 40pin 0.5mm pitch; Ex. Molex 54104-4031

Standard Tolerance:
(Unless otherwise specified)
Linear: ±0.3mm

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Drawing/Part Number:	Revision:
NHD-4.3-800480CF-ASXP	2D

Unless otherwise specified:
• Dimensions are in Millimeters
• Third Angle Projection

Drawn By:	Approved By:
K. Lewis	K. Lewis
Drawn Date: 10/13/2023	Approved Date: 10/13/2023

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/m²
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_G	-	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://support.newhavendisplay.com/hc/en-us/articles/4414491960599-EK9716B

Built-in EK73002AB2 Gate Driver: https://support.newhavendisplay.com/hc/en-us/articles/4414491516183-EK73002AB2

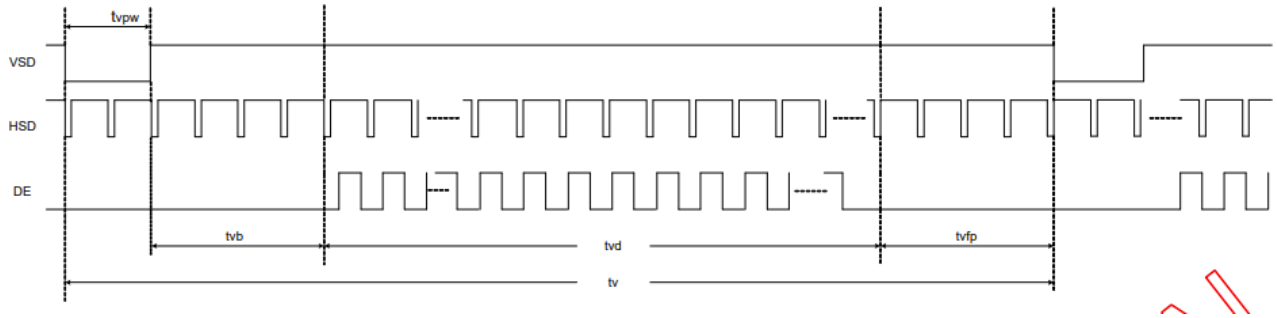
Timing Characteristics

Parallel RGB Input Timing Requirements

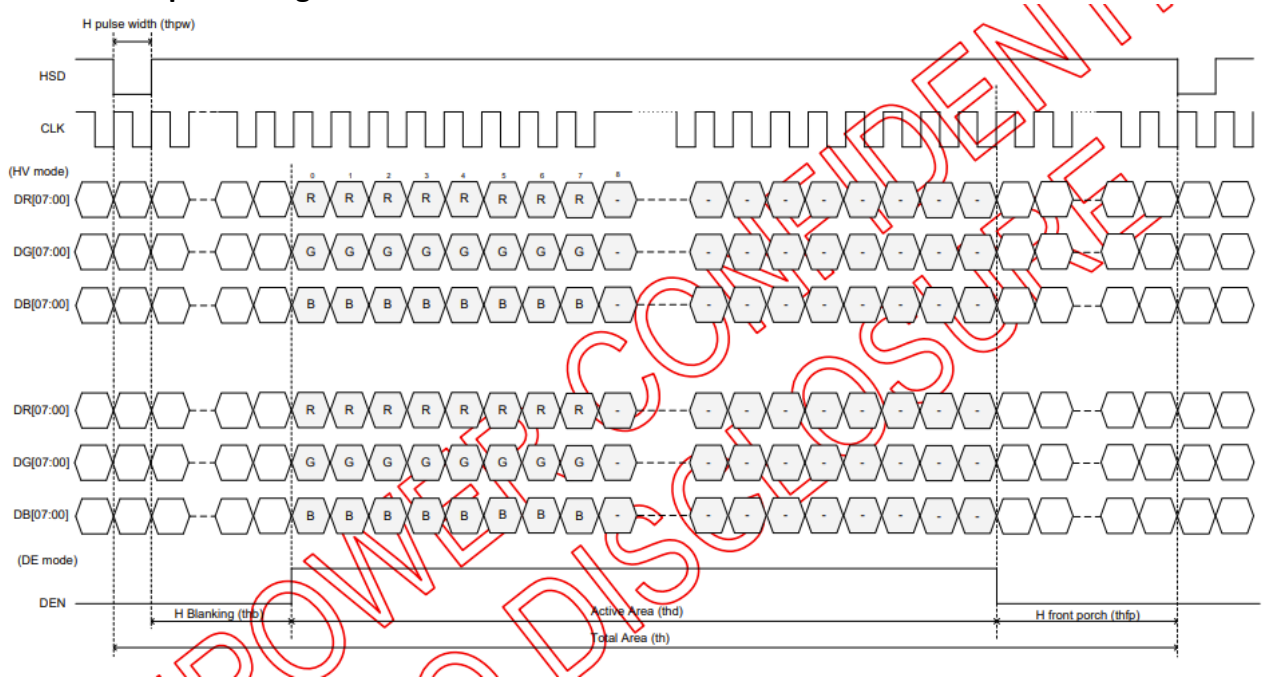
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	28.2	29.2	40	MHz	-
DLCK Period		Tclk	25	34	-	ns	-
HSYNC	Period Time	Th	908	928	1088	DCLK	Thw + Thbp = 88 DLCK is fixed
	Display Period	Thdisp		800		DCLK	
	Pulse Width	Thw	1	48	87	DCLK	
	Back Porch	Thbp	87	40	1	DCLK	
	Front Porch	Thfp	20	40	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	-

Data Input Timing

Vertical Input Timing



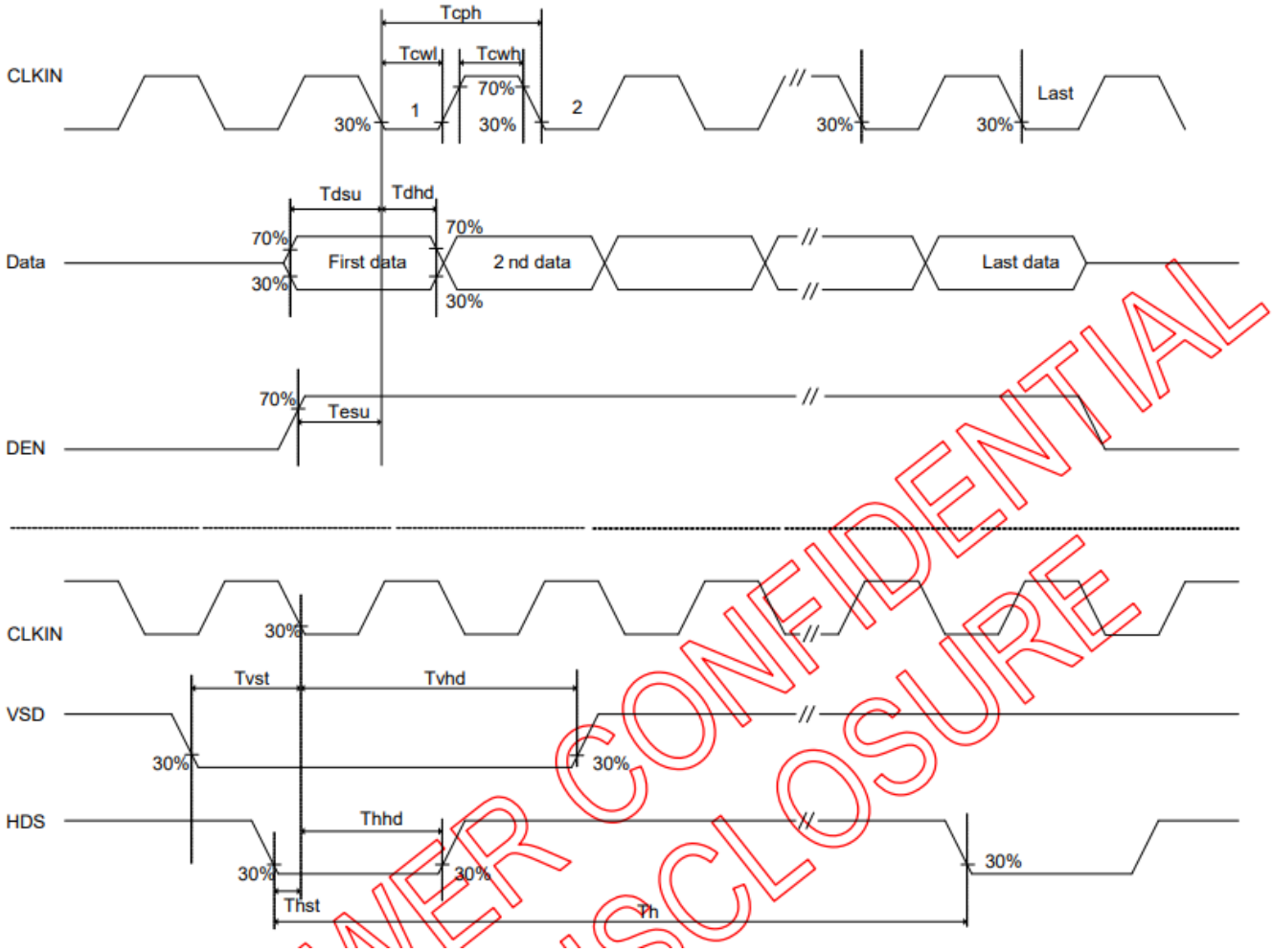
Horizontal Input Timing



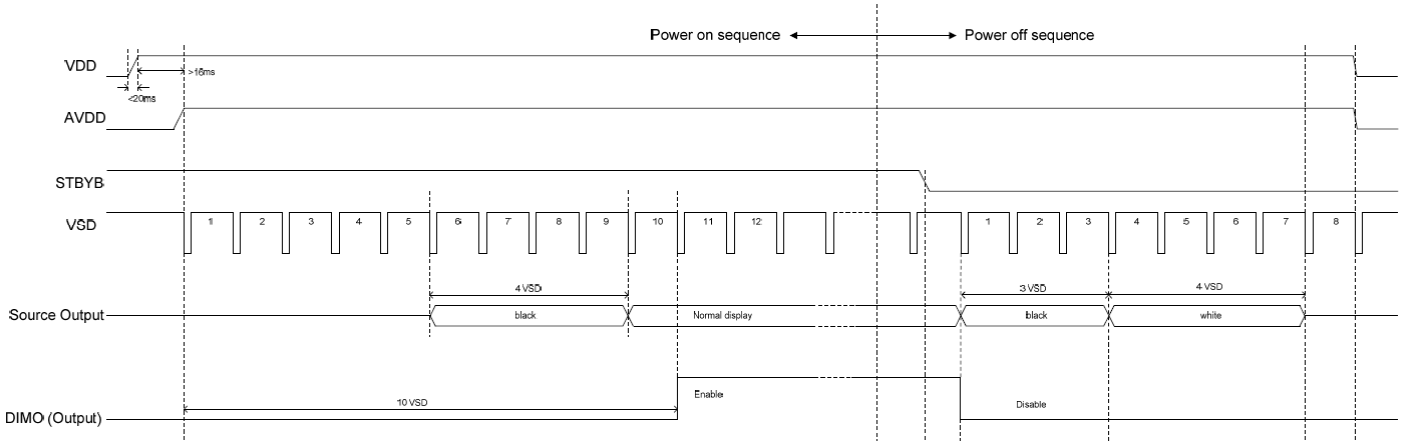
Input Setup Timing Requirements

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
V_{DD} Power Source Slew Time	Tpor	-	-	20	ms	From 0V to 90% V_{DD}
RSTB pulse width	Trst	50	-	-	us	CLKIN = 50MHz
CLK cycle time	Tcph	20	-	-	ns	-
CLK pulse duty	Tcwh	40	50	60	%	-
VSD setup time	Tvst	8	-	-	ns	-
VSD hold time	Tvhd	8	-	-	ns	-
HSD setup time	Thst	8	-	-	ns	-
HSD hold time	Thhd	8	-	-	ns	-
Data setup time	Tdsu	8	-	-	ns	-
Data hold time	Tdhd	8	-	-	ns	-
DEN setup time	Tesu	8	-	-	ns	-
DEN hold time	Tehd	8	-	-	ns	-
Output stable time	Tsst	-	-	6	us	-

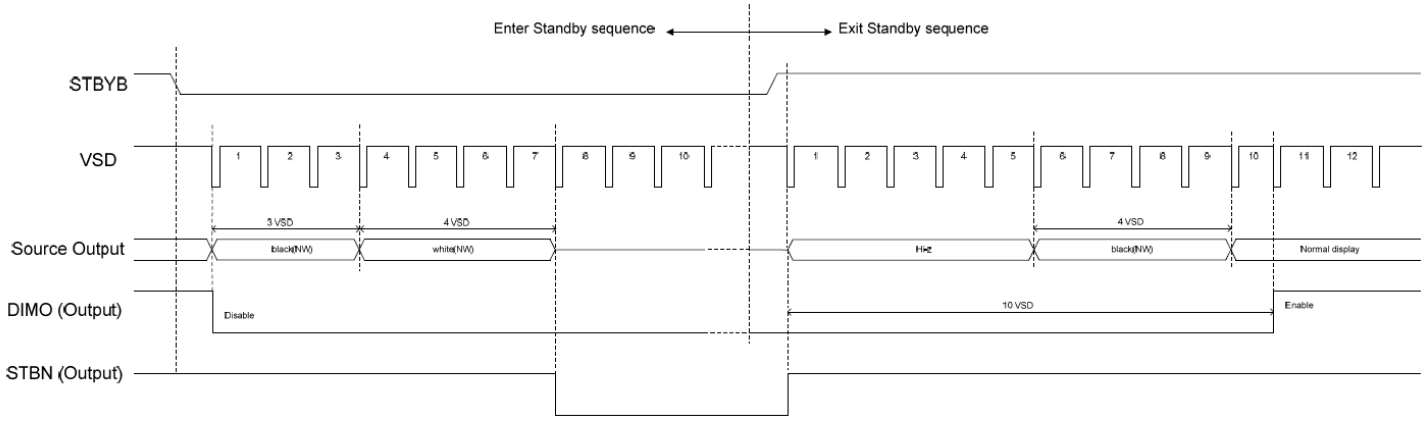
Input Setup Timing Diagram



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=±8KV, Contact: V_S=±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.