

Product Specification

NHD-4.3-480272EF-ASXP

TFT Liquid Crystal Display

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
P-	IPS, Wide Temperature

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Additional Resources

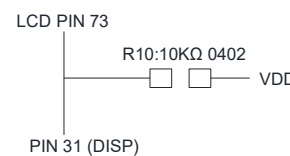
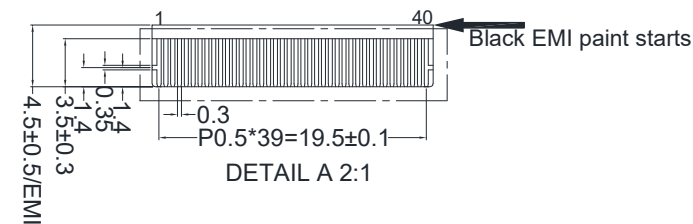
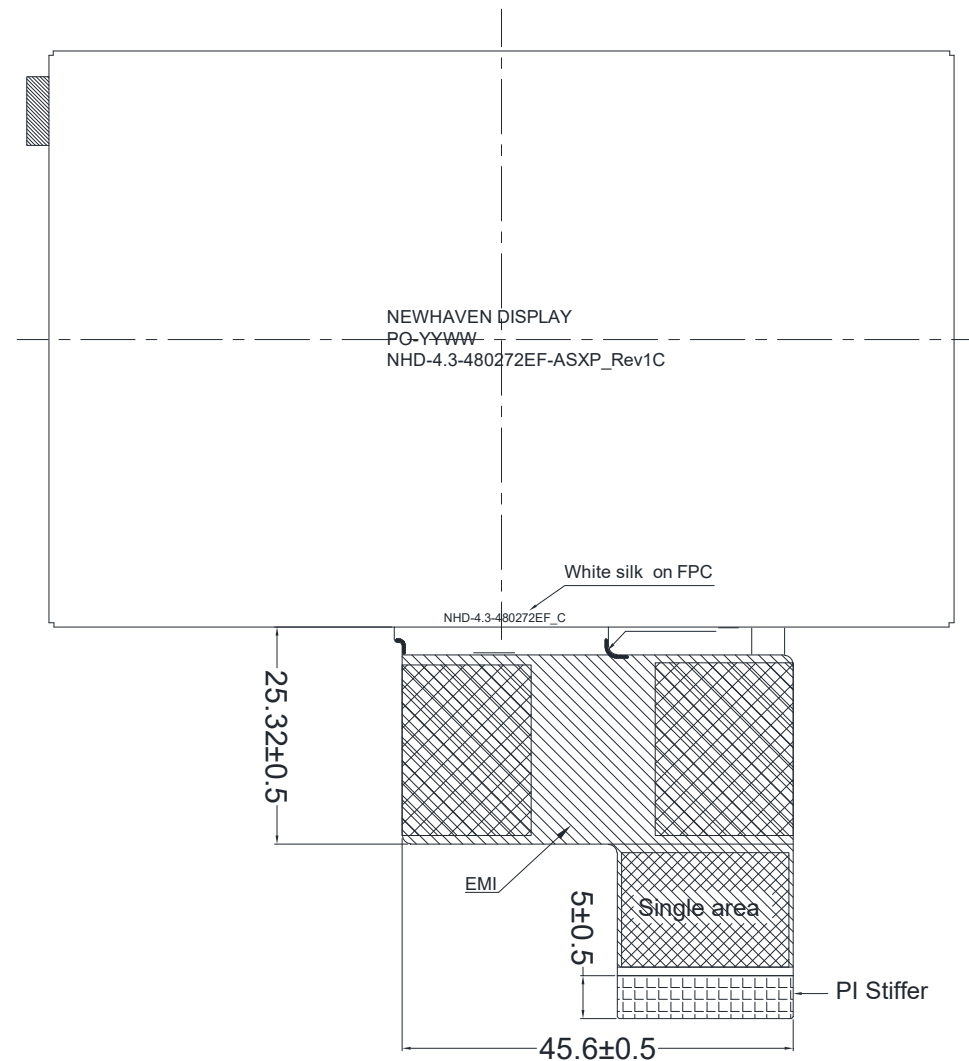
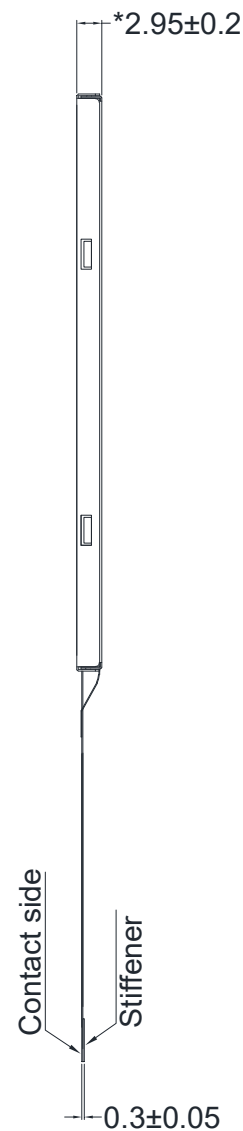
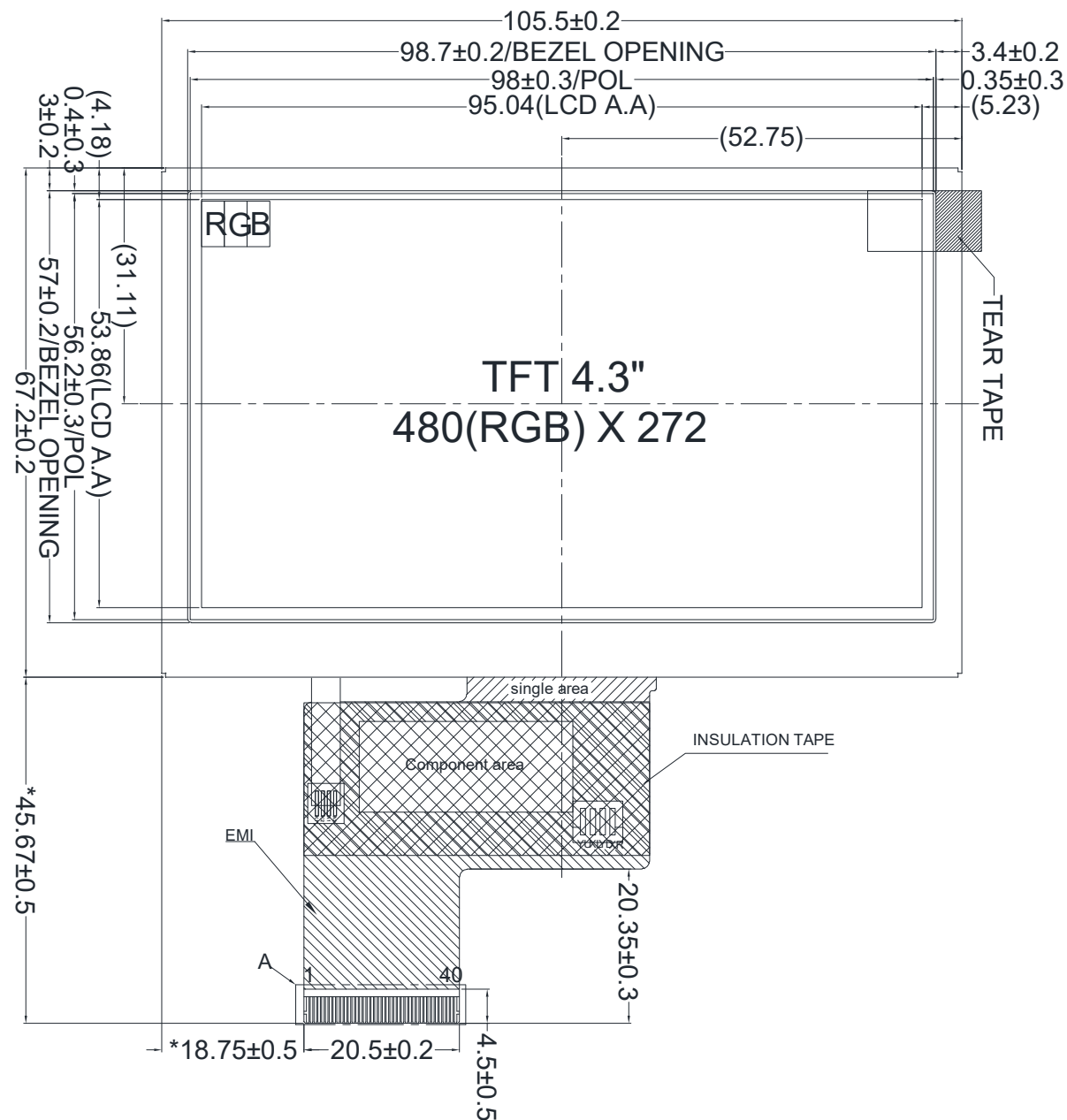
- **Support Forum:** <https://support.newhavendisplay.com/hc/en-us/community/topics>
- **GitHub:** <https://github.com/newhavendisplay>
- **Example Code:** <https://support.newhavendisplay.com/hc/en-us/categories/4409527834135-Example-Code/>
- **Knowledge Center:** https://www.newhavendisplay.com/knowledge_center.html
- **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
0	02/18/2022	Initial Release	CJ
1	05/03/2022	Updated Optical Characteristics	CJ
2	06/01/2022	Updated Typ. Backlight Lifetime	ZP
3	06/08/2022	RGB Interface Mode Selection Included. Backlight Typ. Rating Updated.	ZP
4	11/07/2022	Mechanical Drawing Updated	KL
5	06/14/2023	Part Changed to Rev1B	KL
6	06/28/2023	Mechanical Drawing Updated	KL
7	10/16/2023	Mechanical Drawing Updated	KL
8	12/13/2023	Part Revision Upgraded to Rev1C	KL
9	01/16/2024	Mechanical Drawing Updated	KL
10	10/16/2024	Mechanical Drawing Updated	KL

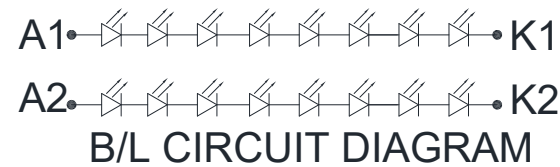
Mechanical Drawing



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

Product Description: 4.3" 480x272 IPS TFT

1. Driver IC: SC7283
2. Interface: 24-bit Parallel RGB
3. Power Requirement: 3.3VTFT, 25.6V/40mA Backlight
4. Optical Features: Normally Black, Transmissive, Anti-Glare, 1000cd/m²
5. Recommended FFC Connector: 40pin 0.5mm pitch; Ex. Molex 54104-4031
6. EMI Shielded FPC



Standard Tolerance: (Unless otherwise specified)		NEWHAVEN DISPLAY INTERNATIONAL	
Linear: ±0.3mm		Drawing/Part Number: NHD-4.3-480272EF-ASXP	Revision: 1C
Unless otherwise specified: • Dimensions are in Millimeters • Third Angle Projection		Drawn By: K. Lewis Drawn Date: 10/16/2024	Approved By: K. Lewis Approved Date: 10/16/2024
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Pin Description

TFT:

Pin No.	Symbol	External Connection	Function Description
1	LED-	LED Power Supply	Ground for Backlight
2	LED+	LED Power Supply	Backlight Power Supply (40mA @ 25.6V)
3	GND	Power Supply	Ground
4	V _{DD}	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	CLKIN	MPU	Clock for input data (Rising Edge)
31	STBYB	MPU	1: Normal Operation; 0: Standby Mode
32	HSD	MPU	Line synchronization signal
33	VSD	MPU	Frame synchronization signal
34	DEN	MPU	Data Enable signal
35	NC	-	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: 54104-4031 (top contact)

Backlight connector: on LCD connector

Mates with: ---

RGB Interface Mode Selection

The Sitronix SC7283 driver IC is user configurable for DE Mode, SYNC mode, or SYNC-DE mode RGB interface.

DE Mode is enabled when HSYNC and VSYNC signals are set to logic-low state, and DE signal is toggled high for valid pixel data. Data is clocked in using DCLK signal. DE mode is recommended to enable the SC7283 driver IC to synchronize the display image on TFT panel without depending on specific horizontal and vertical sync timing from host controller.

SYNC mode is enabled when the DE signal is set to logic-low state, and HSYNC and VSYNC signals are used to explicitly define the horizontal and vertical sync timing to synchronize the display image on TFT panel. Data is clocked in using DCLK signal. Any change to the HSYNC or VSYNC values may prevent the image from correctly appearing on the display.

SYNC-DE Mode is enabled when HSYNC and VSYNC signals are used to explicitly define the horizontal and vertical sync timing to synchronize the display image on TFT panel. DE signal is used as an additional indicator for transmission of valid pixel data. Data is clocked in using DCLK signal. Any change to the HSYNC or VSYNC values may prevent the image from correctly appearing on the display.

RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC-DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

Electrical Characteristics

TFT:

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}	-	0.7 * V _{DD}	-	V _{DD}	V
"L" Level input	V _{IL}	-	GND	-	0.3 * V _{DD}	V
"H" Level output	V _{OH}	-	V _{DD} - 0.4	-	V _{DD}	V
"L" Level output	V _{OL}	-	GND	-	GND + 0.4	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*	-		20,000	-	-	Hrs.

*Backlight lifetime is rated as Hours until **half-brightness**, under normal operating conditions. The LED of the backlight is driven by current drain; drive voltage is for reference only. Drive voltage must be selected to ensure backlight current drain is below MAX level stated.

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	800	1000	1500	cd/m ²
Response Time (Rise + Fall)		T _R + T _F	T _{OP} = 25°C	-	30	40	ms
Chromaticity	Red	X _R	-	0.538	0.588	0.638	-
		Y _R	-	0.302	0.352	0.402	-
	Green	X _G	-	0.294	0.344	0.394	-
		Y _G	-	0.538	0.588	0.638	-
	Blue	X _B	-	0.093	0.143	0.193	-
		Y _B	-	0.035	0.085	0.135	-
	White	X _W	-	0.234	0.284	0.334	-
		Y _W	-	0.262	0.312	0.360	-

Driver/Controller Information

TFT:

Built-in SC7283 Source driver: <https://support.newhavendisplay.com/hc/en-us/articles/4414845841687-SC7283>



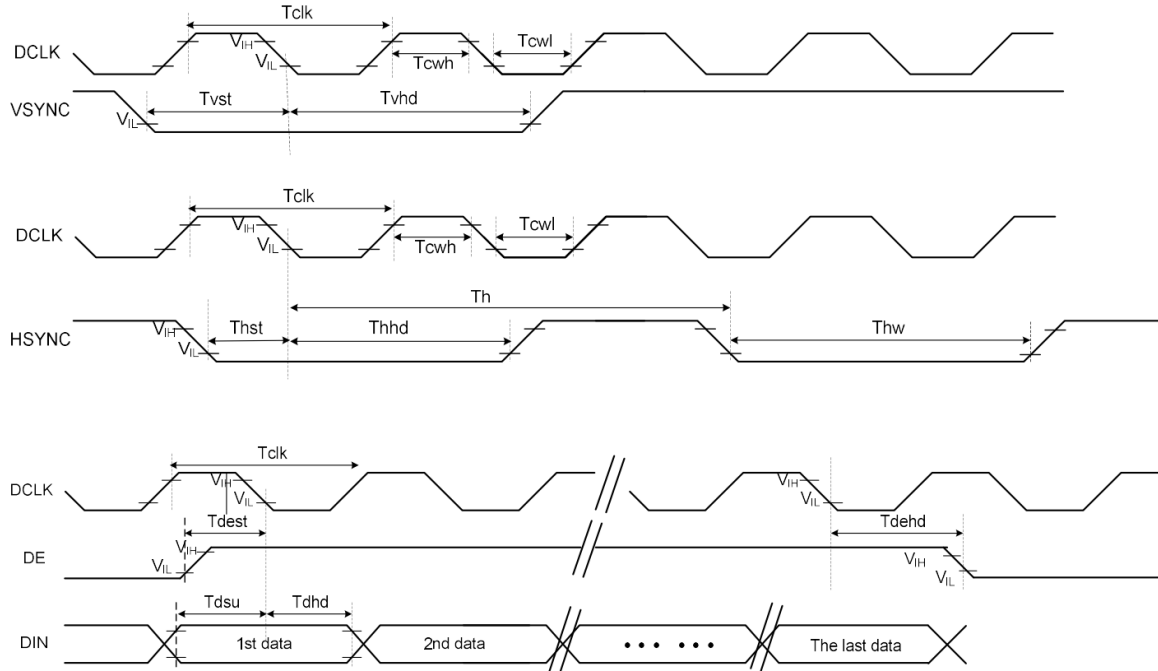
Timing Characteristics – TFT Display

Parallel 24-bit RGB Horizontal and Vertical Input Timing

Item		Symbol	Min.	Typ.	Max.	Unit
DCLK Frequency		Fclk	8	9	12	MHz
DCLK Period		Tclk	83	111	125	ns
HSYNC	Period Time	Th	485	531	598	DCLK
	Display Period	Thd	480			DCLK
	Back Porch	Thb	3	43	43	DCLK
	Front Porch	Thfp	2	8	75	DCLK
	Pulse Width	Thpw	2	4	43	DCLK
VSYNC	Period Time	Tv	276	292	321	H
	Display Period	Tvd	-	272	-	H
	Back Porch	Tvbp	2	12	12	H
	Front Porch	Tvfp	2	8	37	H
	Pulse Width	Tvpw	2	4	12	H

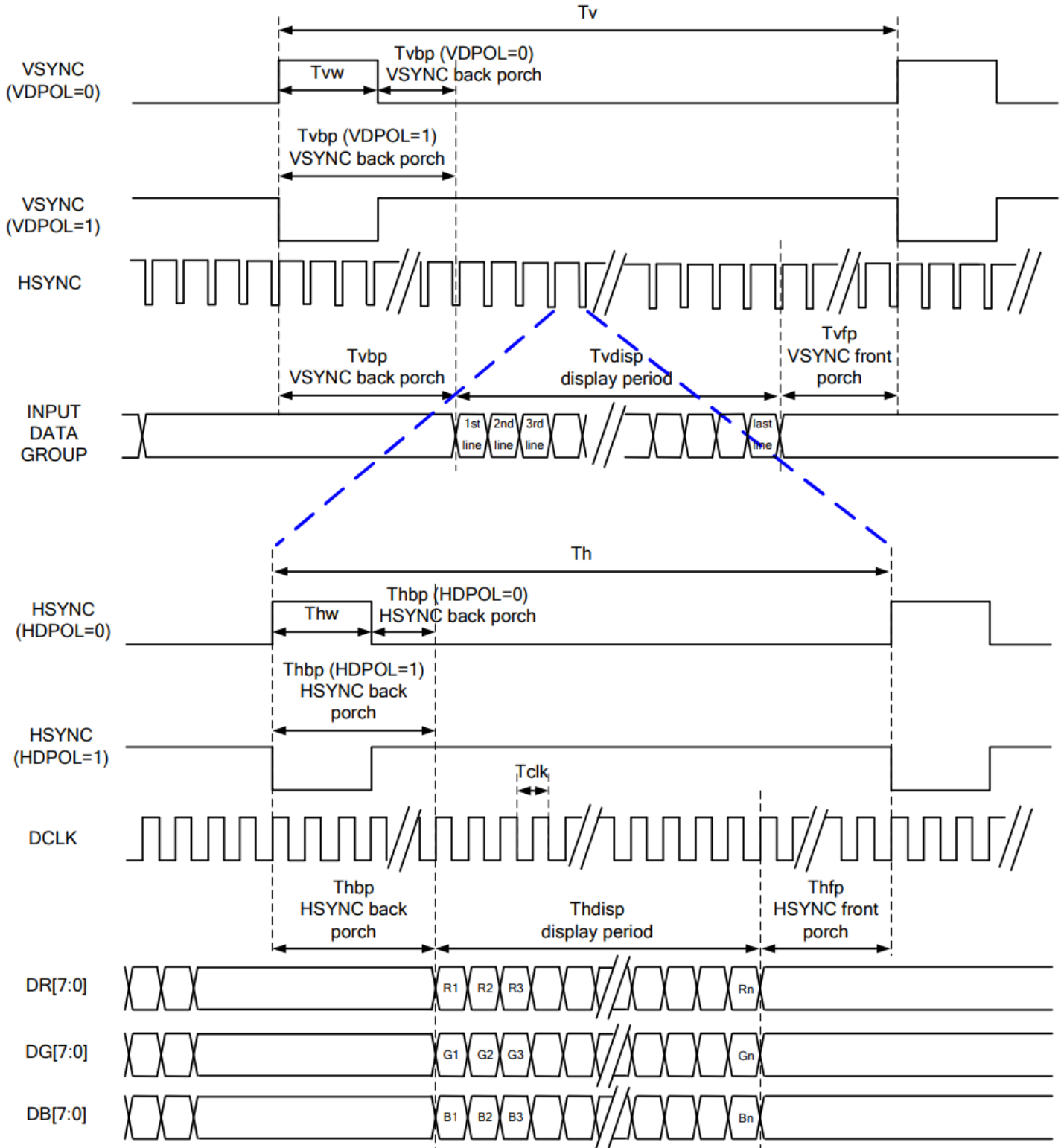
AC Characteristics

System Bus Timing for RGB Interface

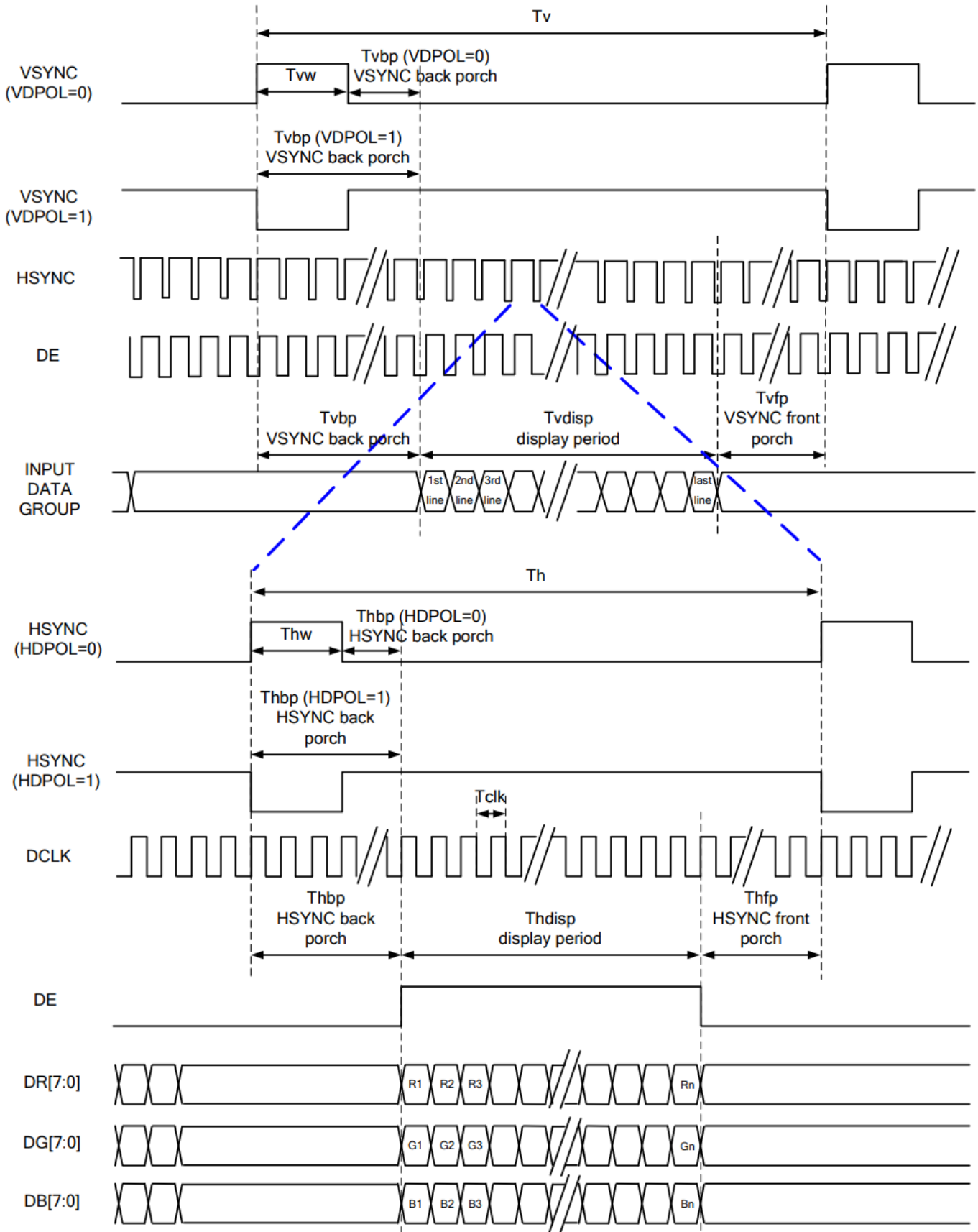


Parameter	Symbol	Min	Typ.	Max	Unit	Conditions
CLKIN pulse duty	T _{cwh}	40	50	60	%	
HSYNC width	T _{hw}	2	-	-	DCLK	
HSYNC period	T _h	55	60	65	us	
VSYNC setup time	T _{vst}	12	-	-	ns	
VSYNC hold time	T _{vhd}	12	-	-	ns	
HSYNC setup time	T _{hst}	12	-	-	ns	
HSYNC hold time	T _{hhd}	12	-	-	ns	
Data setup time	T _{dsu}	12	-	-	ns	
Data hold time	T _{dhd}	12	-	-	ns	
DE setup time	T _{dest}	12	-	-	ns	
DE hold time	T _{dehd}	12	-	-	ns	

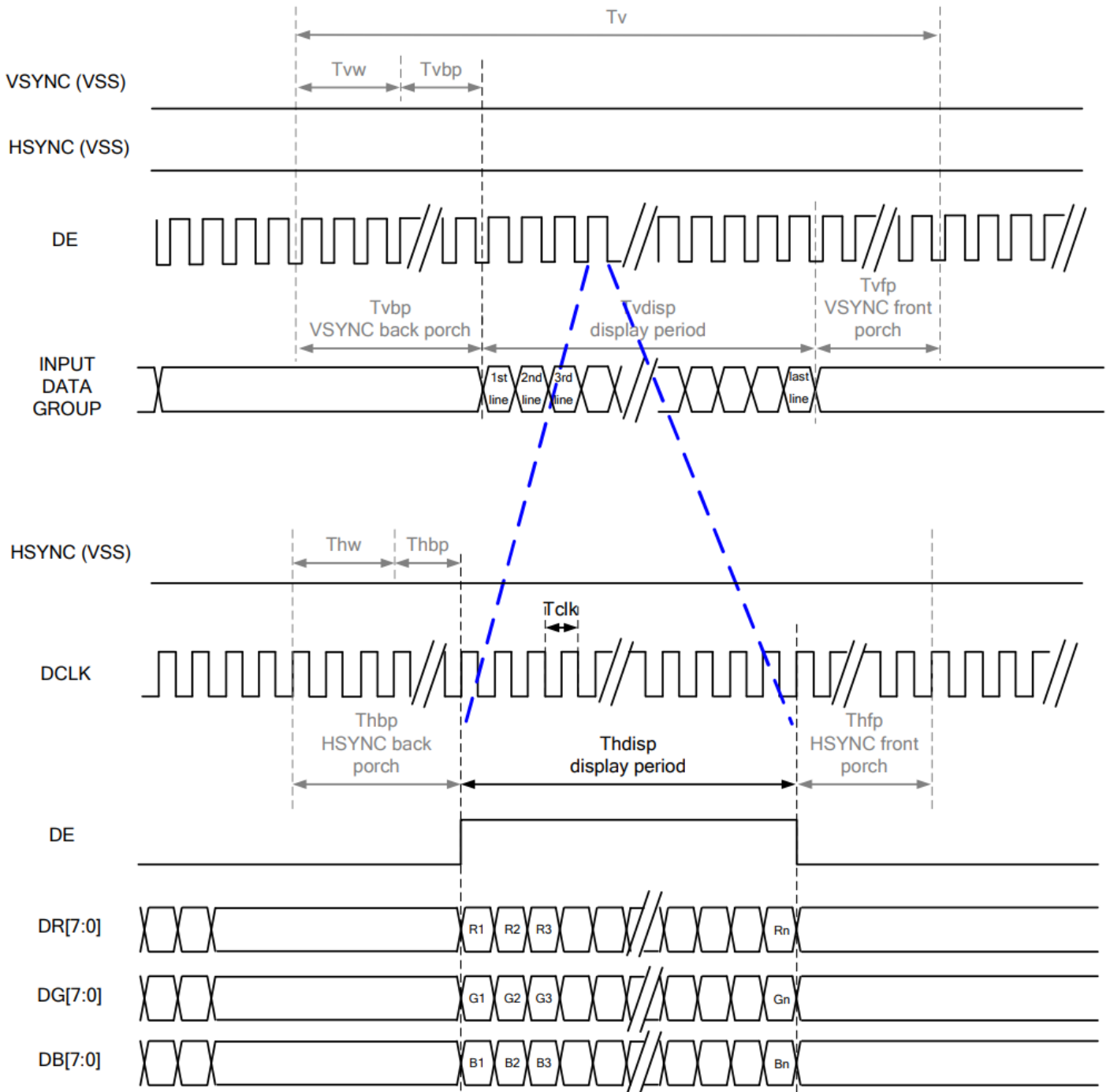
SYNC Mode



SYNC-DE Mode



DE Mode

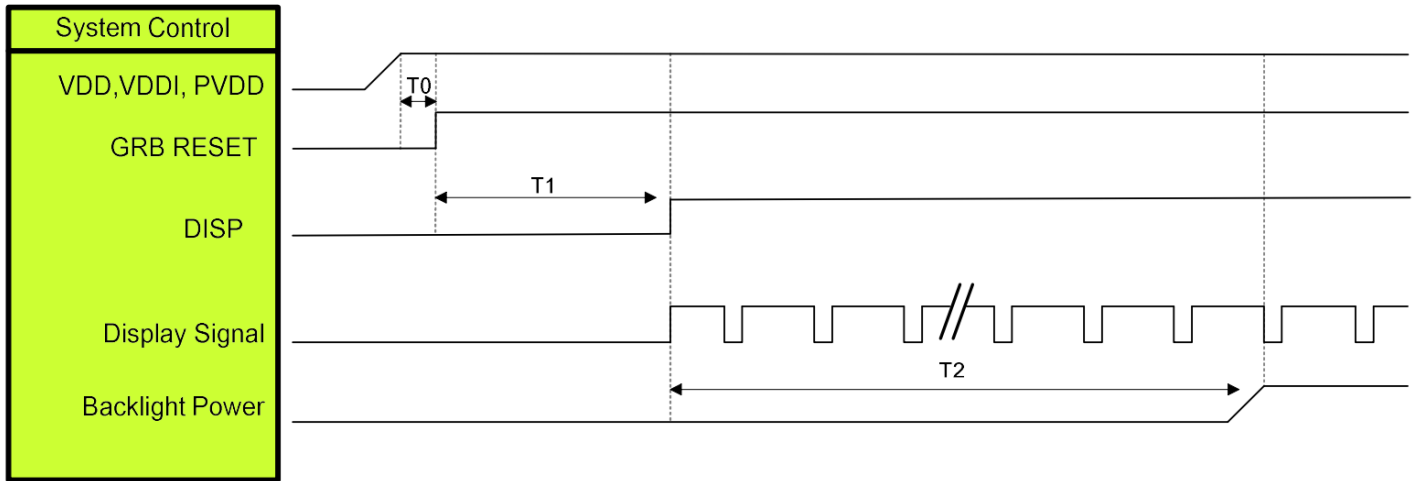


RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

Note: "Input" means these signals are driven by host side.

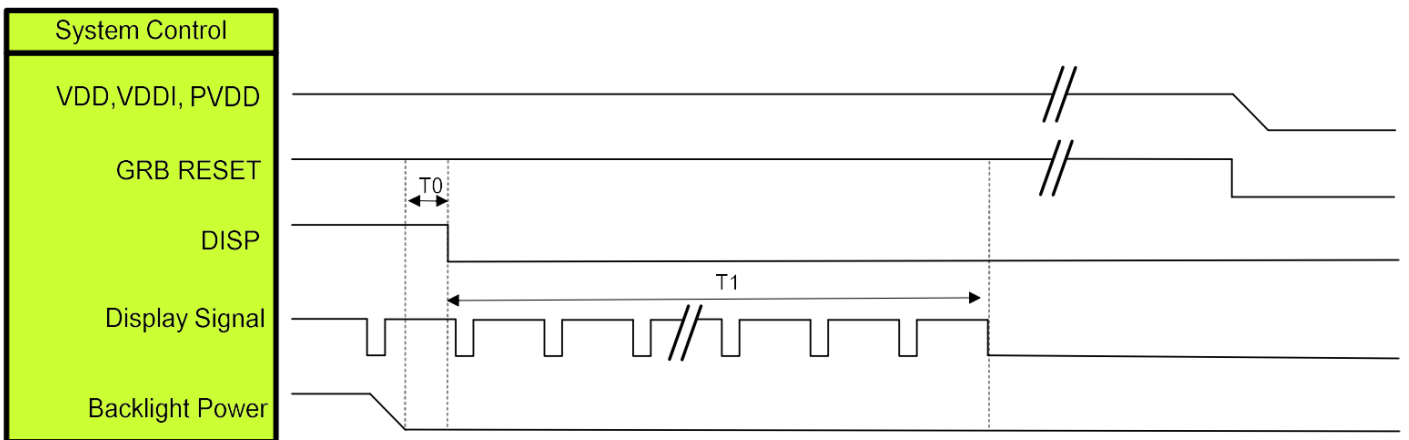
Power ON/OFF Sequence

1. Power On Sequence



Symbol	Description	Min. Time	Unit
T0	System power stability to GRB RESET signal	0	ms
T1	GRB RESET= "High" to DISP="High"	10	ms
T2	Display Signal output to Backlight Power on	250	ms

2. Power Off Sequence



Symbol	Description	Min. Time	Unit
T0	Backlight Power off to DISP="Low"	5	ms
T1	DISP="Low" to IC internal voltage discharge complete	80	ms

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 Storage	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.	-20°C, 60min -> 70°C, 60min = 1 cycle 20 cycles	
Vibration test	Endurance test applying vibration to simulate transportation and use.	10-50Hz, 5G Acceleration 30 minutes in each of 3 directions (X, Y, Z)	3
Static electricity test	Endurance test applying electric static discharge.	Air: ±8kV 150pF/330Ω, 5 Times	
		Contact: ±4kV 150pF/330Ω, 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.