IIDWAY Technology Co. Ltd

PRODUCT SPECIFICATIONS

For Customer:_____ ☐ : APPROVAL FOR SPECIFICATION

Customer Model No._____ ☐ : APPROVAL FOR SAMPLE

Module No.: GZ70132-PIT070WS *Date : 2024.7.8*

Table of Contents

For Customer's Acceptance:

Approved By	Comment

PREPARED	CHECKED	APPROVER
DJF		

2. Revision Record

Date	Rev.No.	Page	Revision Items	Prepared
2024.7.8	V0		The first release	DJF

3. General Specifications

GZ70132-PIT070WS is a *TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC, a back light unit,and CTP. The 7.0'' display area contains* 1024 x (RGB) x 600 *pixels and can display up to 16.7M colors. This product accords with ROHS environmental criterion..*

3.1 LCD Parameter

Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	16.7M		1
Viewing Direction	ALL	O'Clock	
Operating temperature	-20~+70	℃	
Storage temperature	-30~+80	℃	
Module size	Refer to outline drawing	mm	2
Active Area(W×H)	154.21 X 85.92	mm	
Number of Dots	1024 X 600	dots	
TFT Controller	HX8282A11&HX8696A01	-	
Power Supply Voltage	3.3	V	
Backlight	3S10P-LEDs (white)	pcs	
Weight	---	g	
Interface	LVDS	-	

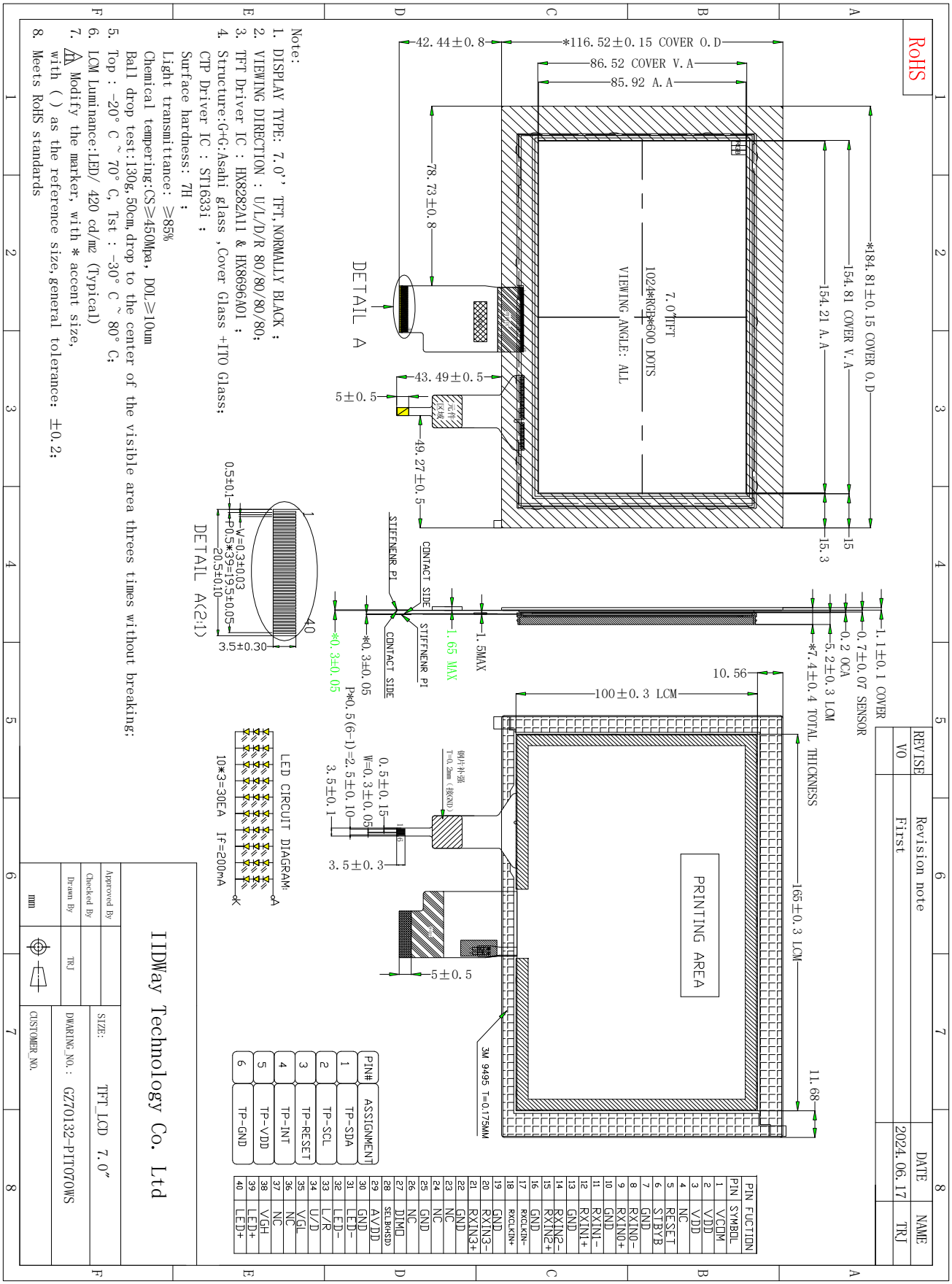
Note 1: Color tune is slightly changed by temperature and driving voltage.

Note 2: Without FPC and Solder.With CTP

3.2 CTP Parameter

Item	Contents	Unit	Note
Outline Size	Refer to outline drawing	mm	
Cover View Area	154.81(H)X86.52(V)		
CTP Resolution	1024x600	dots	
Interface Mode	IIC	-	
Touch Mode	5 Human fingers multi-touch	-	
Surface hardness	>=7H	-	
Transparency	>=85%	-	
Accuracy	Centre +/-1.5mm,Edge +/-2.5mm	mm	
CTP Controller	ST1633i	-	
Power Supply Voltage	3.3	V	

4.Outline.Drawing



5. Absolute Maximum Ratings(Ta=25℃)

5.1 Electrical Absolute Maximum Ratings.(Vss=0V ,Ta=25℃)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	VDD	-0.50	3.96	V	1，2
CTP Power Supply Voltage	VDD	2.8	3.5	V	1，2

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.

2. V_{DD} >V_{SS} must be maintained.

3. Please be sure users are grounded when handing LCD Module.

5.2 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30℃	80℃	-20℃	70℃	1,2
Humidity	-	-	-	-	3

1. The response time will become lower when operated at low temperature.

2. Background color changes slightly depending on ambient temperature.

The phenomenon is reversible.

3. Ta<=40 ℃:85%RH MAX.

Ta>=40 ℃:Absolute humidity must be lower than the humidity of 85%RH at 40 ℃.

6. Electrical Specifications

6.1 Electrical characteristics for LCD(Vss=0V ,Ta=25℃)

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Power supply		DVDD	Ta=25℃	2.7	3.3	3.6	V
Power supply		I_{DVDD}	Ta=25℃	-	18	-	mA
Power supply		AVDD	Ta=25℃	-	9.6	-	V
Power supply		I_{AVDD}	Ta=25℃	-	12	-	mA
Power supply		VCOM	Ta=25℃	-	2.97	-	V
Power supply		VGH	Ta=25℃	-	18	-	V
Power supply		VGL	Ta=25℃	-	-6	-	V
Input voltage	'H'	V_{IH}	DVDD=3.3V	0.7DVDD	-	DVDD	V
	'L'	V_{IL}	DVDD=3.3V	0	-	0.3DVDD	V

6.2.LED backlight specification(Ta=25℃)

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage	Vf	If=200mA	8.1	9	9.9	V	
Uniformity	∆Bp	If=200mA	75	80	-	%	
Life Time	time	If=200mA	30K	-		hours	1

Note 1: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25 ℃

6.3 Interface signals

6.3.1 LCM PIN

Pin No.	Symbol	I/O	Function
1	VCOM	P	Common voltage for panel
2-3	VDD	P	Power supply
4	NC		No connection
5	RESET	I	Global reset signal input pin
6	STBYB	I	Standby mode control pin
7	GND	P	Ground
8	RXIN0-	I	Negative LVDS differential data pair0
9	RXIN0+	I	Positive LVDS differential data pair0
10	GND	P	Ground
11	RXIN1-	I	Negative LVDS differential data pair1
12	RXIN1+	I	Positive LVDS differential data pair1
13	GND	P	Ground
14	RXIN2-	I	Negative LVDS differential data pair2
15	RXIN2+	I	Positive LVDS differential data pair2
16	GND	P	Ground
17	RXCLKIN-	I	Negative LVDS differential clock pair
18	RXCLKIN+	I	Positive LVDS differential clock pair
19	GND	P	Ground
20	RXIN3-	I	Negative LVDS differential data pair3
21	RXIN3+	I	Positive LVDS differential data pair3
22	GND	P	Ground
23-24	NC		No connection
25	GND	P	Ground
26	NC		No connection
27	DIMO		Backlight dimmer signal for external controller. DIMO=H, Logical control signal to turn on external backlight controller. DIMO=L, Turn off external backlight controller. Note: If CABC off, DIMO=DIMI. Else DIMO is controlled by CABC. Please keep floating if not use.

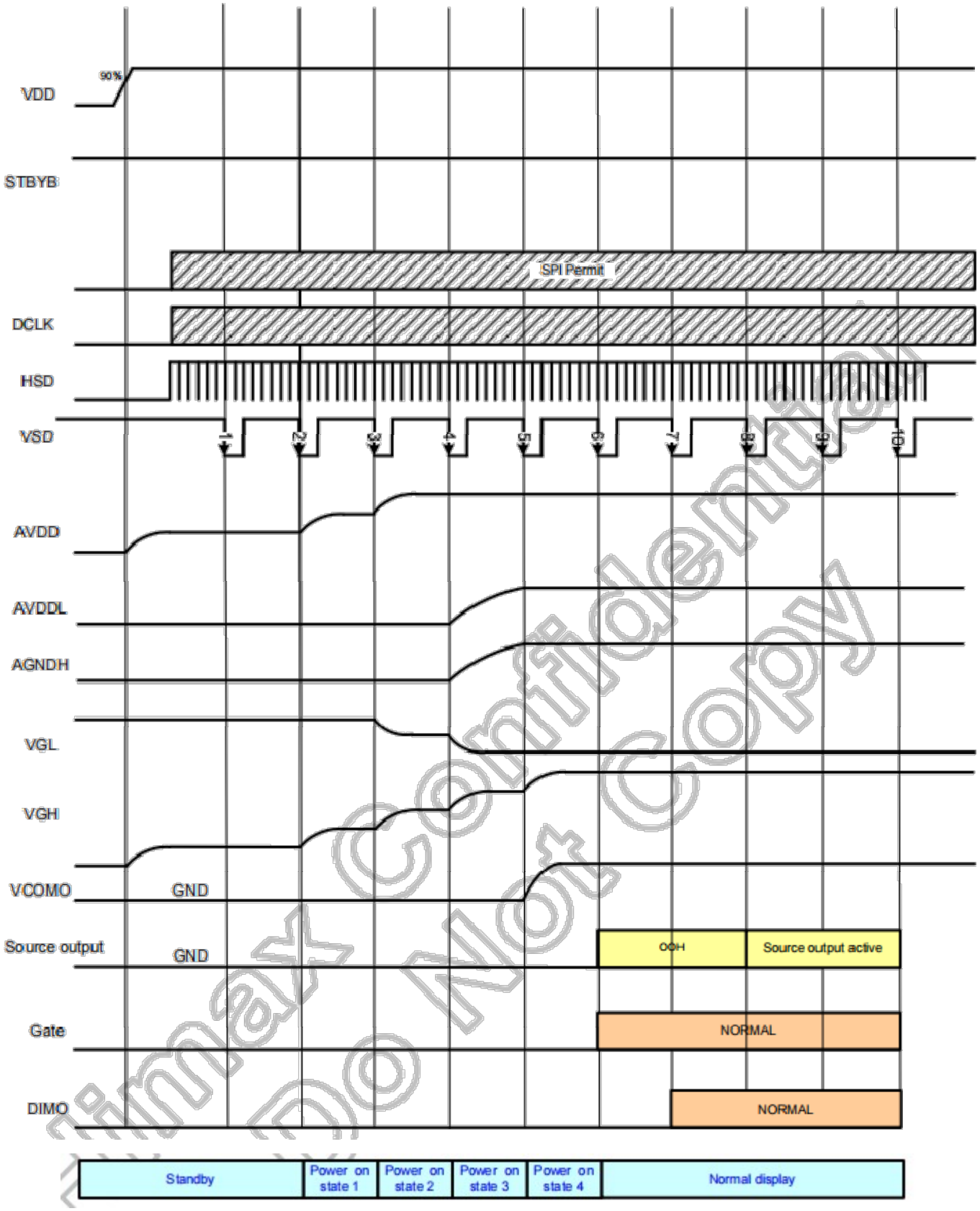
28	SELB(HSD)		SELB=0 ,LVDS 8 BIT SELB=1 ,LVDS 6 BIT
29	AVDD	I	Input positive power from system/ external power IC.
30	GND	P	Ground
31-32	LED-	P	LED back light(Cathode)
33	L/R	I	Select left to right scanning direction
34	U/D	I	Select up or down scanning direction
35	VGL	P	Negative power for TFT
36-37	NC		No connection
38	VGH	P	Positive power for TFT
39-40	LED+	P	LED back light(Anode)

CTP interface

Pin No.	Symbol	I/O	Function
1	TP-SDA	I/O	Serial input/output data bus
2	TP-SCL	I	Serial interface clock
3	TP-RESET	I	Reset signal
4	TP-INT	I	External interrupt pin
5	TP-VDD	P	CTP Analog or digital supply voltage
6	TP-GND	P	Ground

6.4 Power Sequence

Power on



Power off

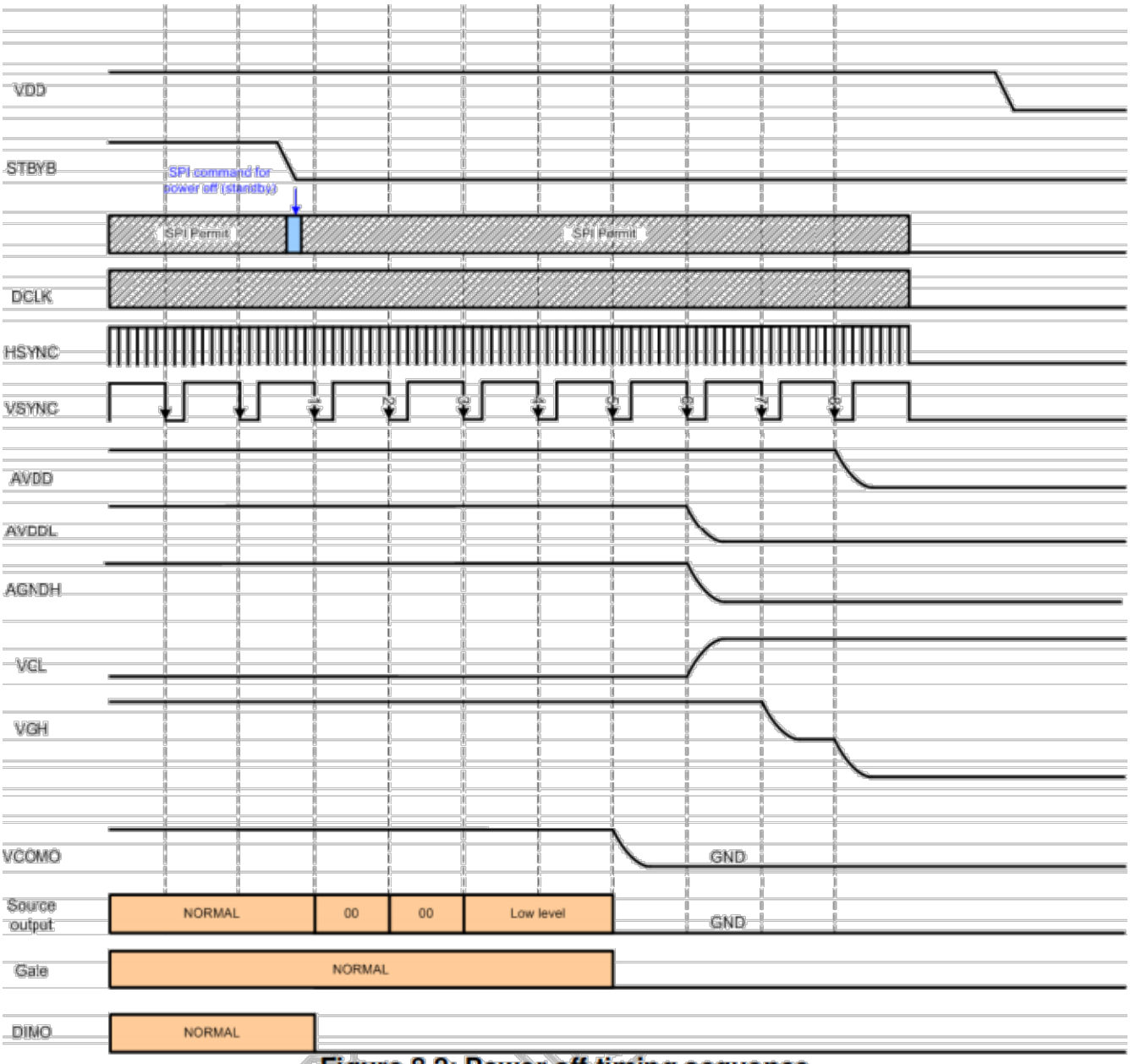
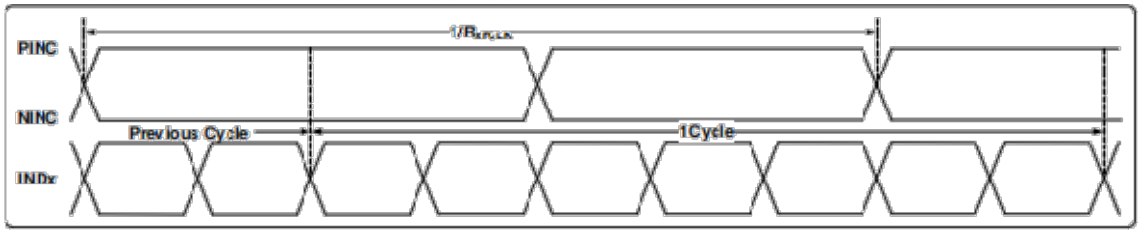


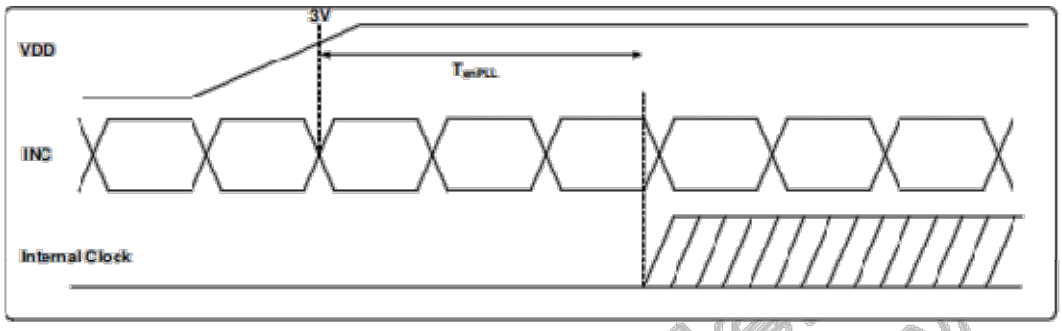
Figure 8.2: Power off timing sequence

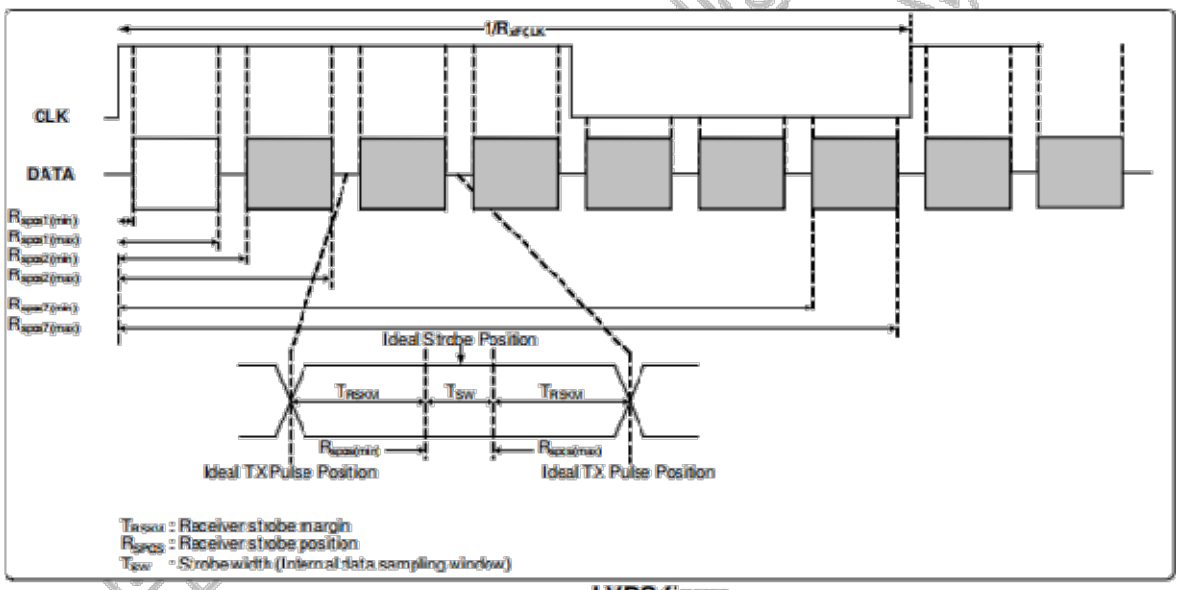
Note: Low level=3FH, when NBW=L (Normally white)
Low level=00H, when NBW=H (Normally black)

6.5 *AC electrical characteristics*

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	R_{XFCLK}	20	-	71	MHz	-
Input data skew margin	T_{RSKM}	500	-	-	pS	$\|V_{ID}\|$=400mV R_{XVCM}=1.2V R_{XFCLK}=71MHz
Clock high time	T_{LVCH}	-	4/(7* R_{XFCLK})	-	ns	-
Clock low time	T_{LVCL}	-	3/(7* R_{XFCLK})	-	ns	-
PLL wake-up time	T_{emPLL}	-	-	150	μs	-





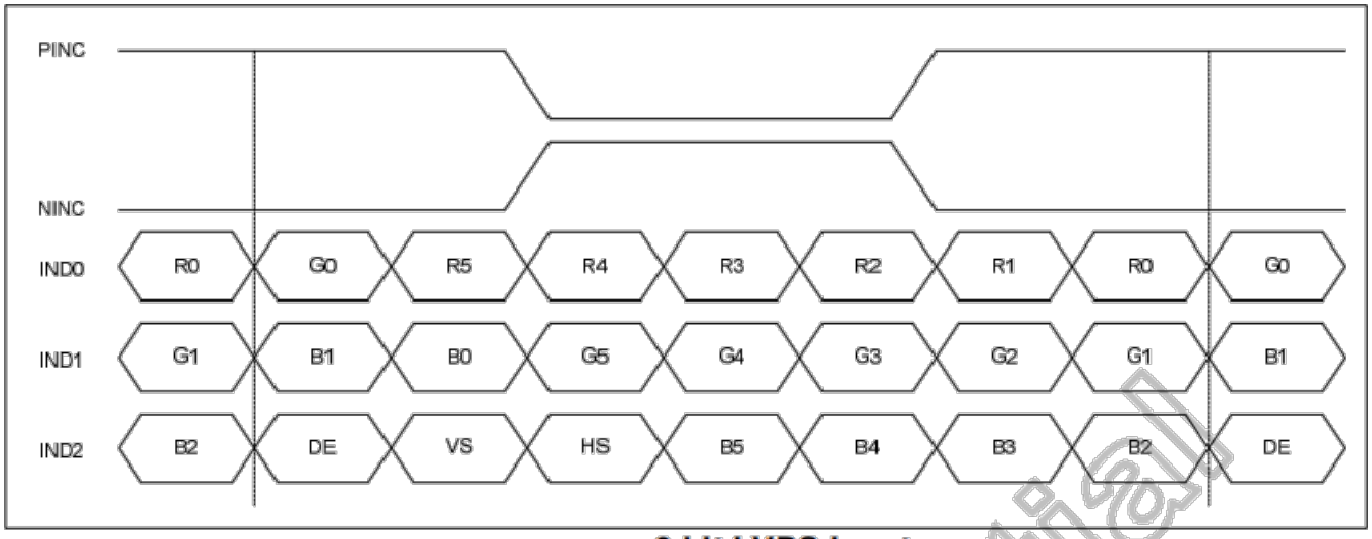


LVDS figure

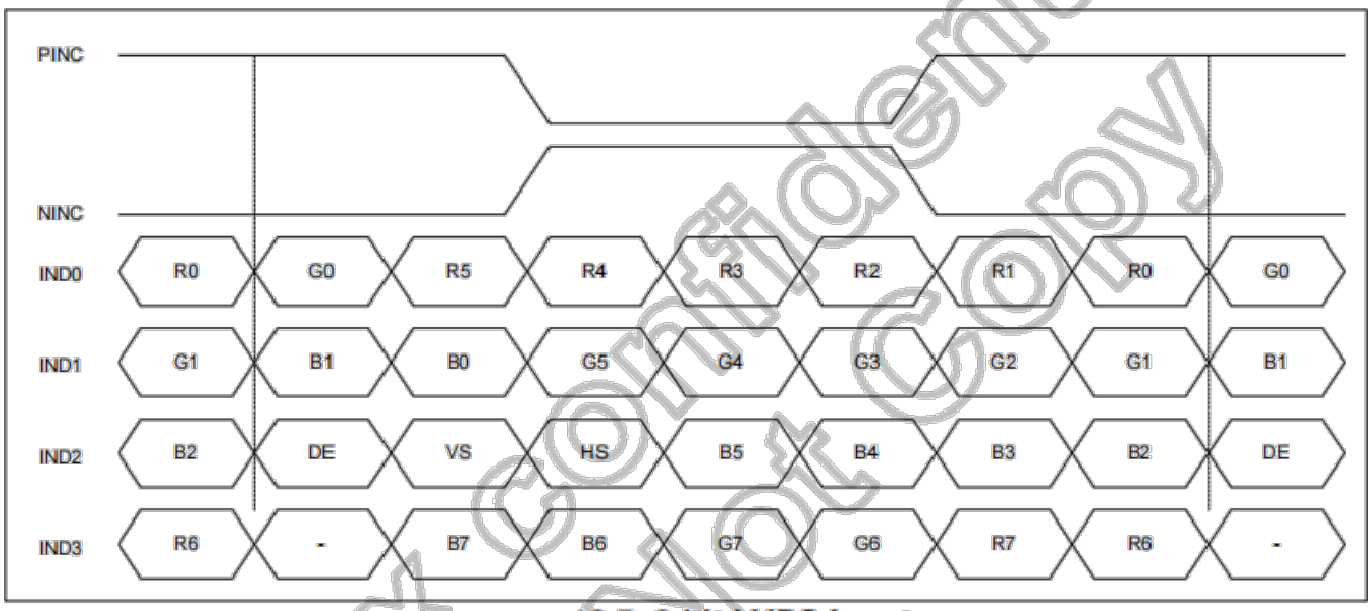
Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Modulation Frequency	SSC_{MF}	23	-	93	KHz	-
Modulation Rate	SSC_{MR}	-	-	±3	%	LVDS clock =71MHz center spread

SSC table

6.6 Data input format



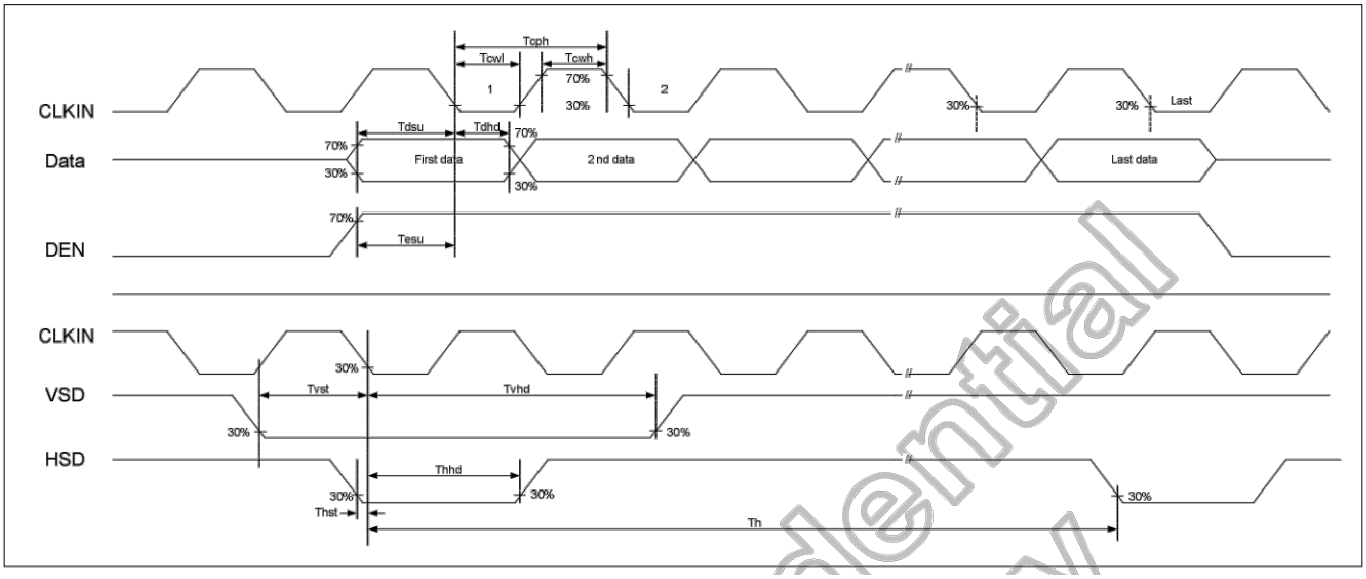
6-bit LVDS input



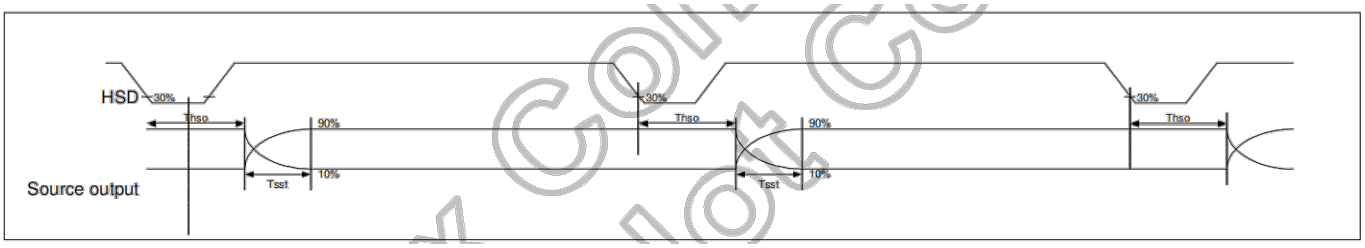
10.5: 8-bit LVDS Input

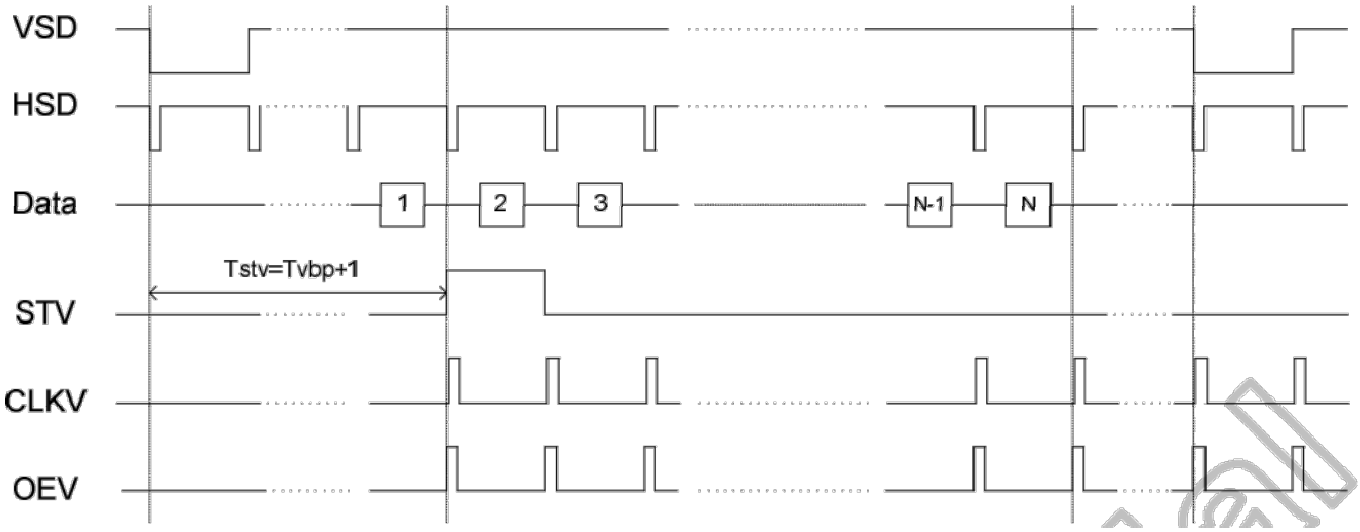
6.7 Timing diagram

Input clock and data timing diagram

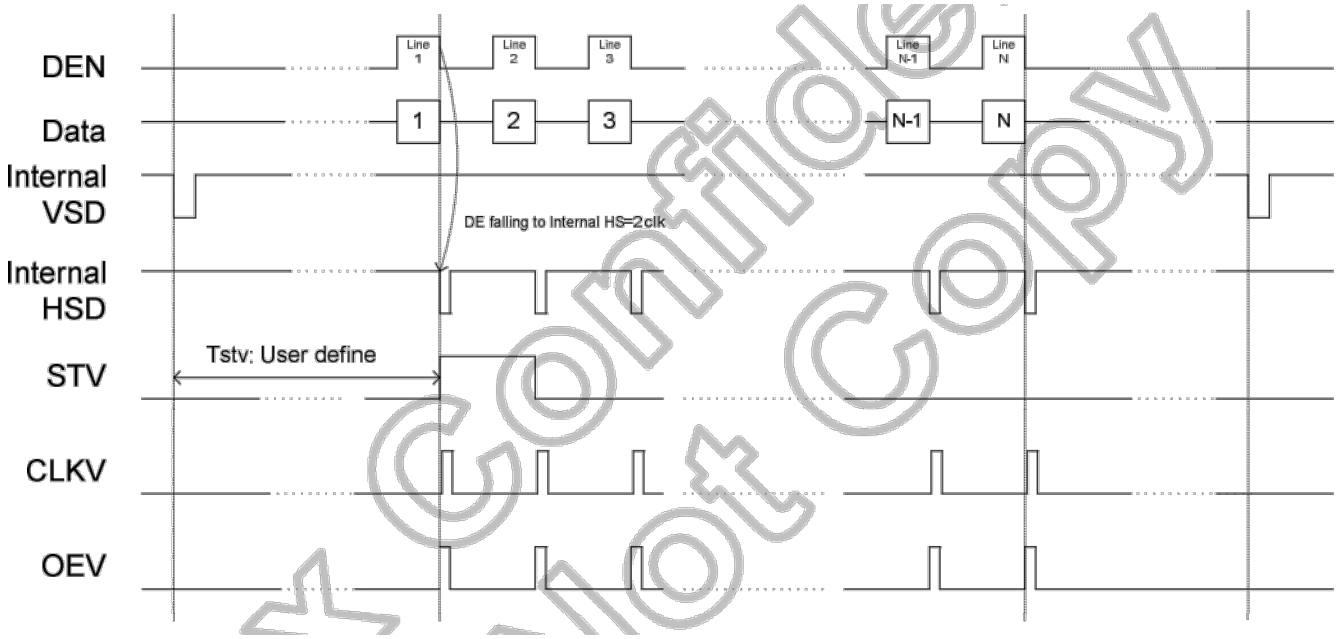


Source output timing diagram (Cascade)

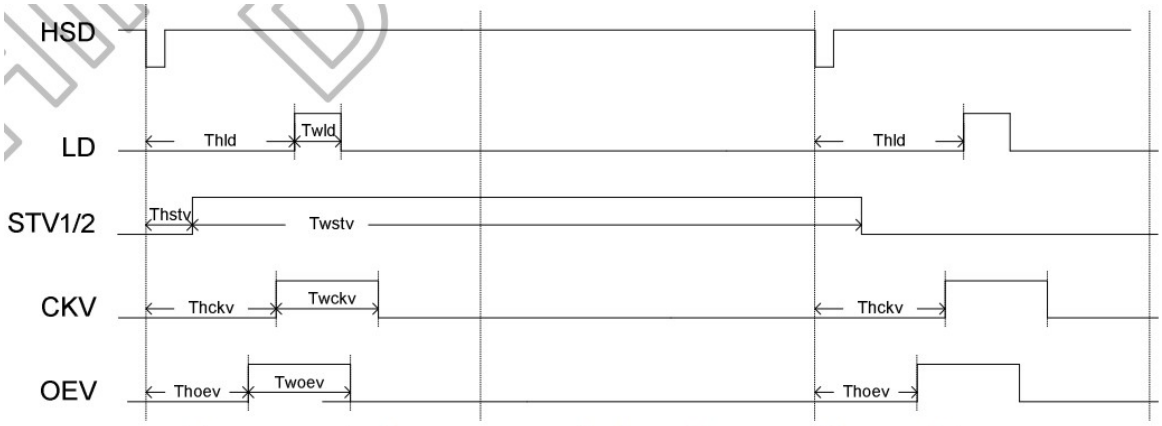




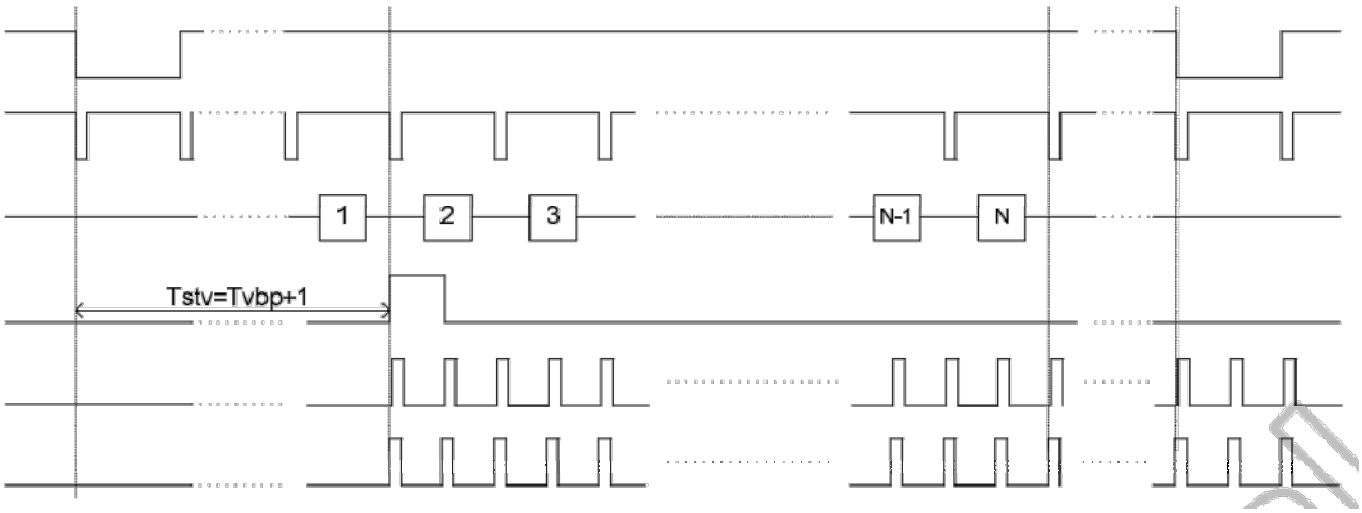
Vertical timing diagram DE (Cascade)



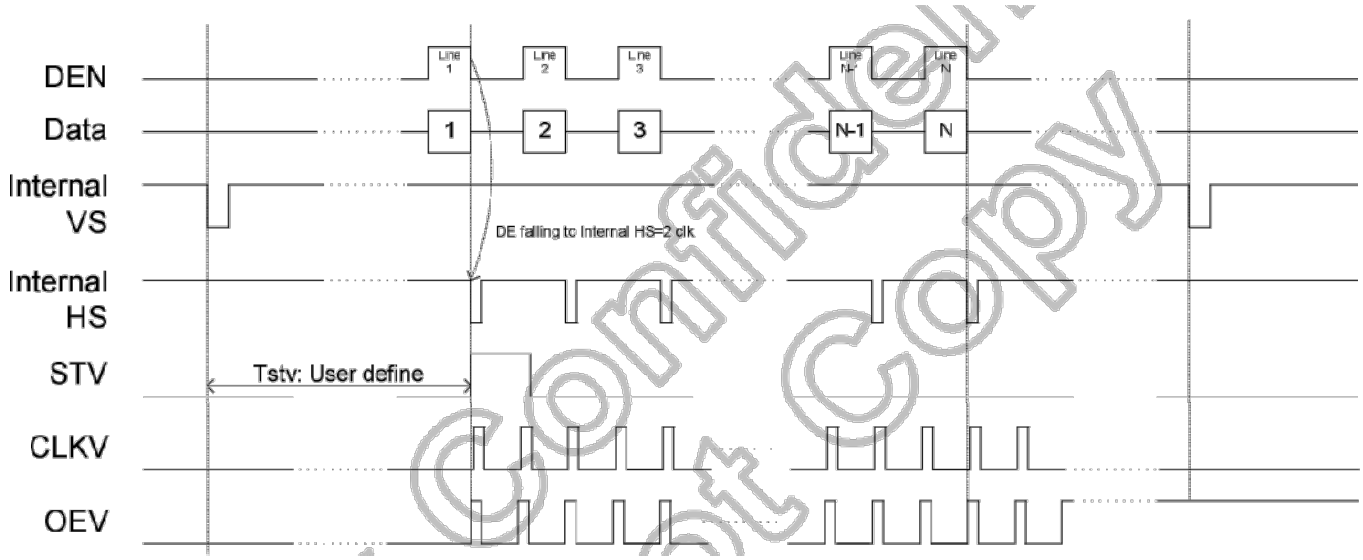
Gate output timing diagram (Cascade)



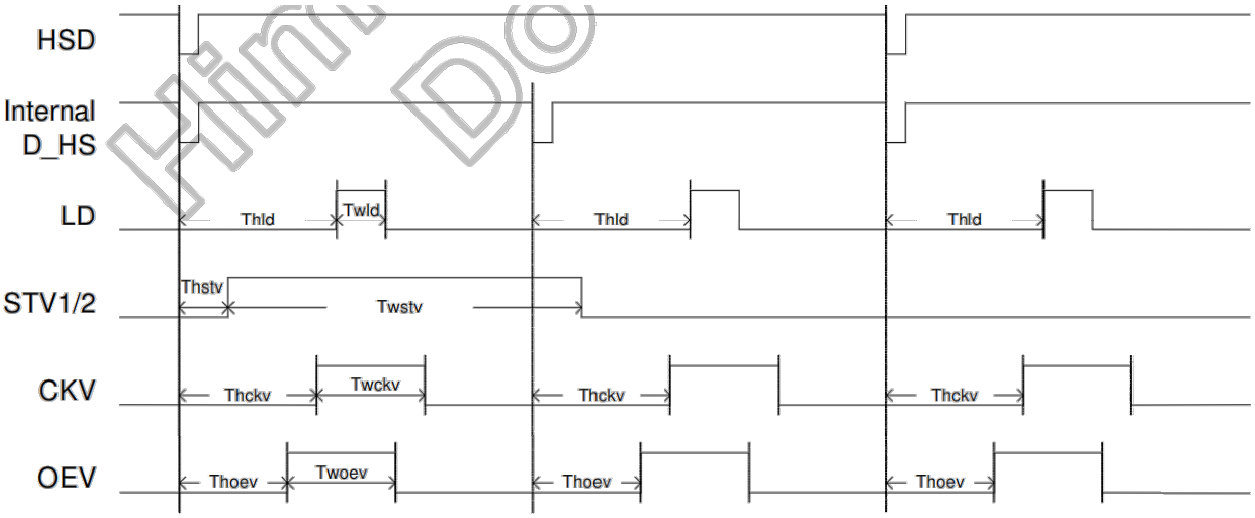
Vertical timing diagram HV (Dual gate)



Vertical timing diagram DE (Dual gate)



Gate output timing diagram (Dual gate)



7. *Optical Characteristics*

Item	Symbol	**Condition**	Min.	Typ.	Max.	Unit	Note
Brightness	Bp	θ=0° Φ=0°	-	420	-	Cd/m^2	1
Uniformity	⊿Bp		75	80	-	%	1,2
Viewing Angle	3:00	Cr≥10	-	80	-	Deg	3
	6:00		-	80	-		
	9:00		-	80	-		
	12:00		-	80	-		

Contrast Ratio	Cr		*Ta*=25℃ Φ=0°	500	800		-	4
Response Time	T_r+T_f			-	25	40	ms	5
Color of CIE Coordinate	W	x	*θ*=0° Φ=0°	Typ -0.05	0.2975	Typ +0.05	-	1,6
		y			0.3353		-	
	R	x			0.5839		-	
		y			0.3550		-	
	G	x			0.3249		-	
		y			0.5772		-	
	B	x			0.1477		-	
		y			0.0962		-	
NTSC Ratio	S			45	50	-	%	

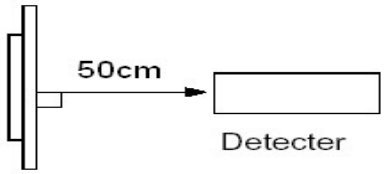
Note：ALL the parameters in the table are slightly changed by temperature, driving voltage and materiel

Note 1: The data are measured after LEDs are turned on for 5 minutes. LCM displays full white. The brightness is the average value of 9 measured spots. Measurement equipment CA310 (Φ5mm)

Measuring condition:

- *Measuring surroundings: Dark room.*
- *Measuring temperature: Ta=25℃.*
- *Adjust operating voltage to get optimum contrast at the center of the display.*

Measured value at the center point of LCD panel after more than 5 minutes while backlight turning on.

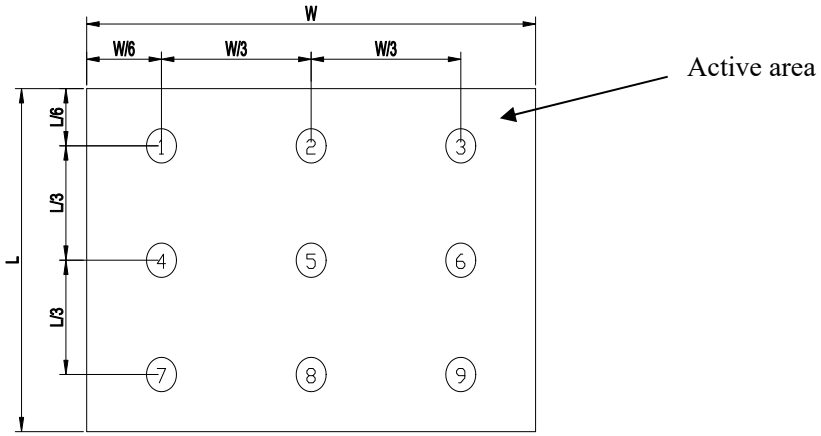


Note 2: The luminance uniformity is calculated by using following formula.

⊿Bp = Bp (Min.) / Bp (Max.)×100 (%)

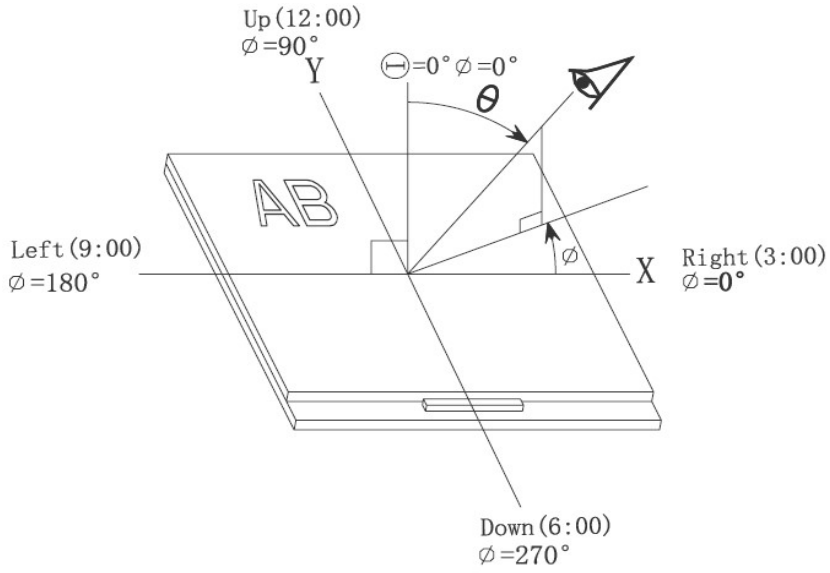
Bp (Max.) = Maximum brightness in 9 measured spots

Bp (Min.) = Minimum brightness in 9 measured spots.

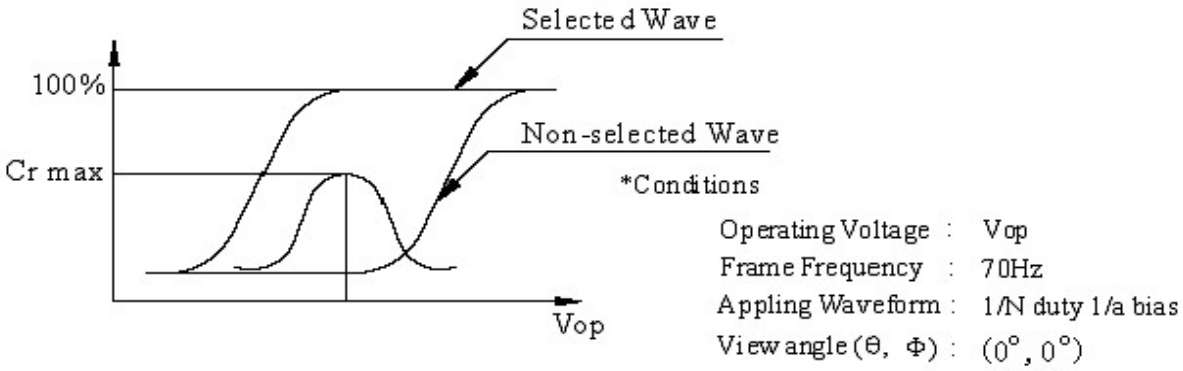


Note 3: The definition of viewing angle:

Refer to the graph below marked by ϑ and Φ



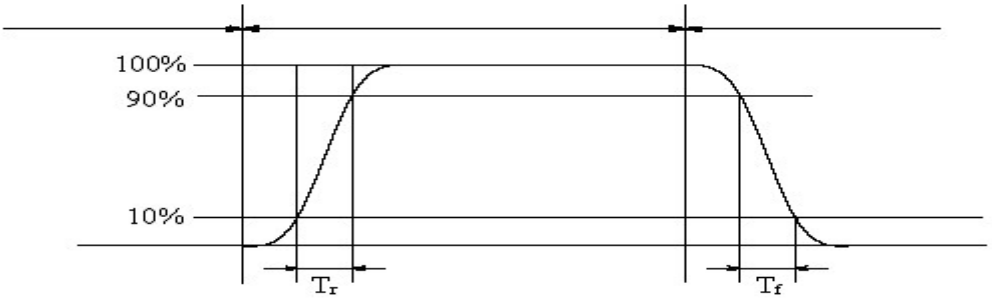
Note 4: Definition of contrast ratio.(Test LCD using DMS501)



$$Contrast\ ratio(Cr) = \frac{Brightness\ of\ selected\ dots}{Brightness\ of\ non-selected\ dots}$$

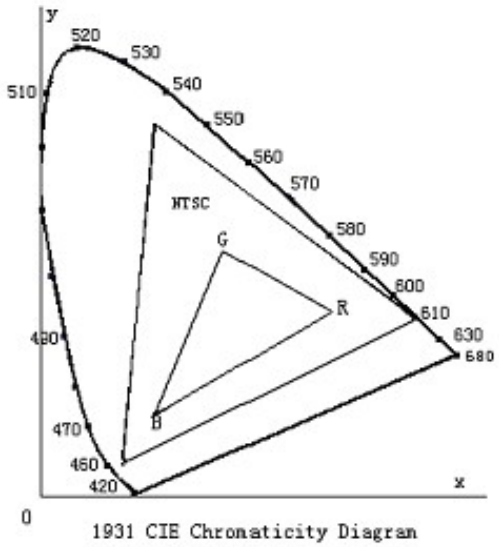
Note 5: Definition of Response time. (Test LCD using DMS501):

The output signals of photo detector are measured when the input signals are changed from"black"to"white"(falling time) and from" white"to "black"(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes.Refer to figure as below.



The definition of response time

Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.



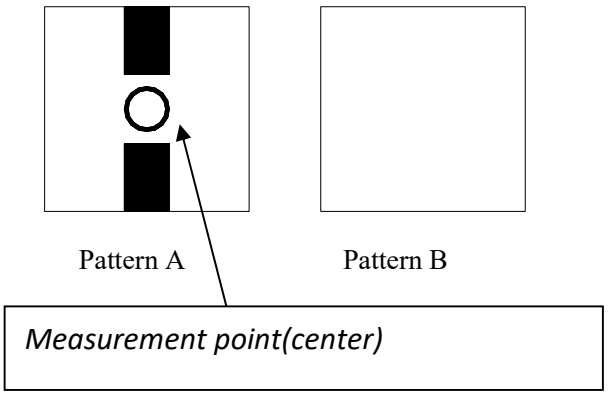
1931 CIE Chromaticity Diagram

Color gamut:

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

Note 7: Definition of cross talk.

*Cross talk ratio(%)=|pattern A Brightness-pattern B Brightness|/pattern A Brightness*100*



Electric volume value=3F+/-3Hex

8. Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	80℃±2℃ 96H Restore 2H at 25℃ Power off	1. After testing, cosmetic and electrical defects should not happen. 2. Total current consumption should not be more than twice of initial value.
2	Low Temperature Storage	-30℃±2℃ 96H Restore 2H at 25℃ Power off	
3	High Temperature Operation	70℃±2℃ 96H Restore 2H at 25℃ Power on	
4	Low Temperature Operation	-20℃±2℃ 96H Restore 4H at 25℃ Power on	
5	High Temperature/Humidity Operation	60℃±2℃ 90%RH 96H Power on	
6	Temperature Cycle	-30℃←————→80℃ 30min 5min 30min after 5 cycle, Restore 2H at 25℃ Power off	

Note: Operation: Supply 3.3V for logic system.

The inspection terms after reliability test, as below

ITEM	Inspection
Contrast	CR>50%
IDD	IDD<200%
Brightness	Brightness>60%
Color Tone	Color Tone+/-0,05

9. *Precautions for Use of LCD Modules*

9.1 Handling Precautions

9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

9.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

— Isopropyl alcohol — Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

— Water — Ketone — Aromatic solvents

9.1.6 Do not attempt to disassemble the LCD Module.

9.1.7 If the logic circuit power is off, do not apply the input signals.

9.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

a. Be sure to ground the body when handling the LCD Modules.

b. Tools required for assembly, such as soldering irons, must be properly ground.

c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

9.2 Storage precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃

Relatively humidity: ≤80%

9.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

9.3 ***The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.***

END